THE IRON AGE

New York, March 21, 1918

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THE pictures on these two pages are arranged to give you a panoramic idea of the growth of the Chas. A. Schieren Company.

Fig. 1 represents the building at 90 Gold St., New York, where, in 1868, Chas. A. Schieren first made leather beltings.

Fig. 2 illustrates our Dixie Tannery at Bristol, Tennessee, as completed and first operated in 1893.

Fig. 3 is a photograph of our Tannery at Brooklyn, New York, where lace leather is made.

Fig. 4 shows the Dixie Tannery as it looks today, where all of the hides that enter into SCHIEREN Beltings go through the long-time pure oak bark process of tanning.

Fig. 5 shows the Schieren Building at 30-38 Ferry St., in the very heart of downtown New York, and the present home of factory and main offices, including the Export Department.

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War Materials

A by-product coke plant is of great value in producing war materials. From every ton of coal carbonized in a Koppers By-product Coke Oven there is recovered—

Coke for making iron

Gas for making steel

Tar for fuel, drugs, dyes, etc.

Ammonia for nitric acid and fertilizers

Toluol for high explosives

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A Koppers By-product Coke Plant will produce high grade metallurgical coke and high yields of these important products.

H. KOPPERS COMPANY

PITTSBURGH, PENNSYLVANIA

Builders of BY-PRODUCT COKE PLANTS

THE IRON AGE

New York, March 21, 1918

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The Housing Problem

What the Owner of a City Factory Can Do and the One with Limited Capital—An Answer from a Bridgeport Text

by W. E. Freeland

BRIDGEPORT in the last three years has acquired sudden fame as a great munitions center. Early in the war period the story of the high wages paid its workmen attracted a great influx of workers and in this short period its population has doubled. In this lively Connecticut city huge new plants sprang into existence almost over night and old plants grew and grew in their efforts to keep up with the flooding tide of war orders. And with this great growth came an acute housing problem. Rents soared into almost fabulous figures, but private capital could not build with sufficient speed to take care of the incoming crowds of workers. The labor turnover problem of the factories became inextricably involved with the housing problem.

For almost two years the city grew in the haphazard manner that is characteristic of most American communities. About eighteen months ago twelve manufacturers and the three big public service companies—furnishing gas, water and electricity—combined in an effort to attack the problem in a scientific manner. The Bridgeport Housing Co. was formed with a capital of $1,000,000.

The Bridgeport Housing Co. now has as stockholders twenty of the representative industrial and mercantile organizations of the city, in a few cases the stock standing in the name of individuals. It is unique in the opportunity it affords to the smaller business house to have a part in a vital work for the welfare of the whole city; it is unique, too, in the fact that the stockholders have voluntarily limited the dividends to 6 per cent, thereby eliminating any tinge of profiteering; no charge that it is an attempt to exploit labor can be brought against it because it does not attempt to dictate what occupation a man shall follow nor does it bind him to employment with any of the subscribers to the stock of the company. It aims to make it easy for a workman to own his own home and has no designs to become a landlord trust.

Its organization was brought about by the Chamber of Commerce of the city after more than a year of intensive effort. At a time when it was

Along the Street Front on Connecticut Avenue

somewhat difficult to find the capital to take care of plant expansion, it was no easy task to divert any considerable portion of the liquid funds of the city from enterprises paying large profits to an enterprise with such a limited profit. It took men with large vision to back such a program in such a time of financial stress; fortunately Bridgeport had such.

The officers of the company are H. H. DeLoss, president; George M. Eames, vice-president; Charles G. Sanford, treasurer; George Gove, secretary; William H. Ham, general manager. With the exception of the manager, who gives his entire time to the work, all the officers serve without pay. The directors include among others: Edgar W. Bassick, president Bassick Co.; N. W. Bishop, president B. D. Pierce, Jr., Co.; Waldo C. Bryant, president Bryant Electric Co.; George E. Crawford, president Bridgeport Chamber of Commerce; H. H. DeLoss, vice-president Handy & Harman; George M. Eames, manager Singer Mfg. Co.; George C. Edwards, vice-president International Silver Co.; William H. Ham, general manager Bridgeport Housing Co.; H. H. Hamilton, president Hamilton & DeLoss Co.; John T. King, president King Machine Co.; Frederick J. Kingsbury, president Bridgeport Brass Co.; Walter B. Lashar, president American Chain Co.; James G. Ludlum, manager International Silver Co.; H. H. Pinney, formerly manager Remington Arms Co.

A manager was appointed who began an investigation of the many phases of the problem. An experienced city planner was called in to make a survey of the city. He recommended the purchase of two or three different parcels of land, one of which was bought as the initial site of a housing development. A building committee was formed, comprising a manufacturer, a lawyer, a banker, and the president of the company (a manufacturer), ex-officio. One of the first steps of this committee was to employ an architect to plan a large apartment house.

The first manager having resigned, William H. Ham, a Boston engineer of wide experience, was chosen to succeed him. Under his direction active steps toward actual construction were undertaken. Plans for houses were carefully studied to fit them to the needs of the people to be housed. Experts were employed to aid in the determination of the proper sizes of rooms and to plan for efficient but economical plumbing and sanitary features. The best minds available were called upon to set the enterprise upon its way toward a logical solution of the intricate problem. A landscape architect lent his aid toward placing the houses in an attractive environment. The manager devoted himself to the task of standardizing the features devised by this expert staff so that purchases of equipment could be made in the wholesale manner that was essential if costs were to be kept down. Soon things began to move forward with the speed that the emergency demanded.

In February of last year work was begun on the apartment house and on a model group of buildings in another part of the city. In June the first of the tenants began to move into the apartment house and a little later the houses in the other development began to be ready for occupancy. While this work was in progress two other suburban developments were undertaken, one in Fairfield, the other in Stratford.

The apartment house has 39 apartments of three rooms and bath each. A similar type of house is frequently found in New York under the name of studio apartments. The building has a roof garden and every apartment opens onto a fire escape arranged to serve as a veranda. The building is situated within five minutes' walk of a bathing beach at one of the city parks. The three upper floors are rented at $30 for each apartment and the lower floor at $25. This includes heat and hot water, but each tenant pays for lights. This apartment house has appealed to the clerical workers of the city for whose needs it was particularly designed. Like all the other homes built by the company, it is equipped with all the appliances that are considered a part of a modern city home, such as gas ranges, kitchen cabinets, shades, screens, etc. Built during a period of high costs, this structure pays a fair return on the investment, which was $2,410 for each family, plus $154 for land and development, including sidewalks, hedges and other planting.

The next development, shown at the head of this article, consists of 87 row type houses of single and two-family sizes, affording homes for 139 families. Twenty-four of these apartments have two rooms and bath; 40 have three rooms and bath; 47 have four rooms and bath, and 28 have five rooms and bath. The ground plan shows that this tract has been laid out on the lines endorsed by the experts in community planning. It has its own playgrounds, a large one for the older children and a smaller one for the younger children, and two stores, page 731, one of which is now being run on the co-operative plan for the sale of foodstuffs. The tract is situated near several large factories and the illustrations tell better than words the appearance of the houses. Housekeeping apparatus such as gas hot-water heaters, gas ranges, kitchen cabinets, good bathrooms, set tubs, shades and screens are included with every apartment. The houses, built of brick, with slate roofs, are set near the street line, so as to leave as much room as possible for attractive back yards. Hedges enclose these yards, the entrances being marked by concrete posts. The big playground is found in the center of the large quadrangle, and is being equipped with the usual playground apparatus. The front of the

houses is being planted with shrubbery to add to the attractiveness. The illustrations show the simplicity of design of the entrances. This simplicity of design and lack of tinsel ornateness characterizes the interior as well as the exterior of all the houses erected by the company.

The houses in the large quadrangle, comprising about 60 per cent of this development, are heated by hot water supplied from the power plant of the nearby factory of one of the interested manufacturers. The other houses are heated by furnaces, one furnace for each apartment. Each apartment has a separate front and back entrance and a separate cellar. These houses have been so planned that each room has sunlight during some part of the day and each apartment has a separate piazza in the rear, opening from the kitchen. A service drive in the rear of the houses brings all deliveries to the back doors, but so much attention has been paid to the landscape features of the courts, playgrounds and back yards that the grounds in the rear of the houses are much more attractive than the front approaches. Although there is the unusually large number of 21 families to the acre, the rows of houses are so skillfully located that there is no crowding. The company furnishes a man as gardener and repair man, and the leases state that the company shall have the right to inspect each apartment monthly. A record of each inspection is made monthly on a slip, here reproduced, and submitted to the manager.

The apartments heated by hot-air furnaces rent as follows: Two rooms, $15; three rooms, $18.50; four rooms, $24; five rooms, $29. For the portion heated by hot water a variable charge is made on the basis of the number of rooms, with a maximum monthly charge for winter, a minimum charge for summer and an intermediate charge for spring and fall.

Suburban Developments

Under the direction of one of the prominent architects of the country, the company has erected a group of houses at Fairfield and another group at Lordship in the town of Stratford. Both of these developments are in easy reach of the industrial sections of the city. At the Fairfield tract, 60 acres in extent, of which a little is waste land, the plans call for a development for 300 families, about eight families to the acre on the land actually utilized. At the present time about six acres have been developed with homes for 36 families. These houses are of brick with slate roofs and have five or six rooms with bath. Later a few seven-room houses may possibly be built. Most of the houses are single dwellings, but in suitable locations are placed several semi-detached and duplex two-family houses. The single houses and the semi-detached double houses are of the one and one-half story type. Six different exterior designs have been evolved to break up any appearance of monotony. All the sanitary fixtures and household apparatus that have been made standard by the company are found in these homes. Heating is by hot-air furnaces and the tract has all the public service conveniences.

The houses are laid out with latticed laundry yards and at least 50 per cent of each lot is available for gardens. The company is planting the front of each house and is taking every advantage offered for good landscape work. In connection with the laundry yard there has been built a skeleton garage which can be completed for about $100. At both the suburban developments there is a great demand for garages, as the highly paid workers of the city have become to a surprising extent owners of motor cars. This same development has brought a big problem to the factories as at many of the big plants the entire neighborhood is cluttered with automobiles during working hours—cars that belong to mechanics.

The plans for the further development of the tract call for a community setting similar to that familiar to all who have visited the typical New England village. There will be a village green with locations about it for stores, and a schoolhouse built in a big park area with plenty of playground room

Along the Winding Way of Alanson Road and the Entrance to Quadrangle and Stores at Connecticut Avenue Development

for athletic sports. The company plans to retain ownership of the stores and the houses immediately surrounding the park so that this portion of the development can be kept up to high standard. The usual restrictions have been applied to these suburban tracts.

The development at Lordship, an attractive seashore part of the town of Stratford, is designed to attract those who can afford to pay a little higher rent. The type and design of the houses is similar to that at Fairfield and the same community planning is evident, although the tract is not large enough to call for the village features that are planned at the other development. Ten six-room and four five-room single houses and three semi-detached two-family houses with five rooms to each apartment have been erected. Hot-air furnaces are used for heating, and in addition each home has an open fireplace. The rents at Lordship range from $27 to $37 and at Fairfield from $27 to $32.50.

Tentative plans of the company call for further developments to meet the demand of common laborers for houses renting at about $16 a month and for a suburban development which is sometimes termed the "permanent camp" type, usually a three or four-room house which can be built at a cost of approximately $1,000 for the house alone. This cheap rural house with some land about it has proved to be highly attractive to families of the Slav, Hungarian and Italian races.

The Manufacturer's Part in Solving the Housing Problem

When a city grows at the rapid pace of Bridgeport because of an industrial boom, it draws to its factories a large percentage of so-called floaters. There is a steady stream of men and women coming and going if industrial conditions or housing conditions are faulty. The labor turnover thus becomes the urgent problem of employers. Married men of mature age with children in the schools form but a small minority of the floating element. It is the young single men or the young married men who flock to cities like Bridgeport in response to the inducements of high wages and steady employment. In such periods of high wage returns the number of marriages shows a great increase. It is these young people of the honeymoon period that Bridgeport is most anxious to attach permanently to the city's working force. It is this need that has brought about the combination of manufacturers, public service companies and bankers which is trying to attack and solve this problem with all the assistance that the new forces of housing experts can offer. They are trying to bring to the study of proper housing the same scientific principles that have made their businesses profitable.

A little more than ten years ago the movement to let light into the factories began to gain force. Gradually factory walls have become largely glass. Good sanitary fixtures, locker rooms, shower baths, restaurants, rest rooms for women workers, welfare work of all kinds gradually became a fixed and essential part of the factory program. Safety and hospital work came into prominence. Factory conditions and plant environment grew into higher standards. It mattered not whether the employer undertook this from philanthropic or economic motives, it was soon discovered that it had a striking economic effect. Particularly did it reduce the labor turnover and the lost time of employees. The cost of labor turnover began to be studied and as a result of this the new professions of employment manager and welfare manager came into being. These studies began to reach out into the home environment of the worker and a new subject of economic interest was brought out into the light. Out of this came the housing movement.

For the material discussed in the remaining portion of this article the writer is indebted to the manager of the Bridgeport Housing Company, Mr. Ham, who has made a profound study of the needs of Bridgeport, needs which do not differ materially from those of most industrial centers. It is not economical for the newly married couple to live in a six-room house. The usual solution to meet this lack of economy lies in the renting of rooms. This produces unhealthy social conditions. Speculative builders have persistently built larger houses than needed so that the rent from excess rooms would help to pay back at an early period the money invested. Under the crowded conditions of Bridgeport and other cities, many of these excess rooms have been rented for light housekeeping, for which they are poorly equipped. This results in the tenants buying largely from delicatessen stores and other places where prices are exceedingly high, producing an uneconomical manner of living and most unsatisfactory social conditions.

Out of a thorough study of the social conditions of employees, Bridgeport has been led to develop both the group type of house and the individual dwelling. The young man and his wife will be satisfied with two or three rooms and bath if the apartment is located in the proper environment.

Date_____ MONTHLY INSPECTION OF HOUSES

Address_____

CELLAR	Ashes Rubbish Rags Paper
CARPENTER WORK	Doors Windows Floors Stair-rail Mouldings Slate roof Down-spouts Gutters Hardware Screens
PLASTER	Cracks Breaks Loose
PAINT-WALLS	Stains by Steam Stains by Dirt Stains by Water
PLUMBING	T. C. Flush Valves Bath Tub and Bibs Gas Stove Lavatory and Bibs Laundry Tubs Hot Water Tank
HEATING	Grates Furnace Pipes Registers Radiator valves.

The Inspection Sheet of the Bridgeport Housing Co. Items to be reported on are contained also on the back of the sheet

A Lordship House in the Summer. This seashore development has met the demands of those who can afford to pay rents ranging from $27 to $37 a month

This House, Erected in Four Weeks, Shows the Possibilities of the Semi-detached House. It was divided into four schoolrooms and 150 children are in attendance. Later the house will be remodeled into two dwellings. As an emergency measure this school has been a great success. In the further development of this tract the plans call for a modern school building in a large park area

In the use of these small apartments the young man finds contentment and economy and thus gains the ability to save for a larger home as his family increases. Taking the working population as a whole, the greatest demand is for four rooms, but there is also a big demand for three rooms. It is not practicable to build detached dwellings of three or four rooms, but for the larger families it is very desirable to build six-room detached houses. It has been proved in Bridgeport that the group houses of two to five-room apartments are very attractive to the workers and that they pay a slightly larger return on the investment.

The manufacturers' interest in the problem lies in its effect upon his labor turnover. A considerable part of this turnover now is due to unsatisfactory home conditions, the uneconomical living in a house too large or in a portion of a house too small for full equipment. Pride in home has almost dropped out of city life, but it is an important part of the social life of the country to-day and in the Americanization of foreign workers and the stabilization of factory labor. The city which builds the most attractively and furnishes the most economical home will reflect in the factory the greatest reduction in labor turnover. It is distinctly a manufacturers' problem.

Individual manufacturers, here and there, have attacked this problem with vigor. In Bridgeport the manufacturers have banded together in a community effort. No part of the development under way is for the exclusive benefit of any one industrial plant. The tenant may work where he will. In agreeing that the time has come for the development of housing in an industrial center on a more comprehensive scale, the stockholders of the Bridgeport Housing Co. are attempting to develop the home units in sizes that will fit all stages of family life. They are building permanent homes, a phase of this matter which will be discussed more fully later in this article. They are trying to establish a standard of homes that will help to limit the activities of the unscrupulous financier or contractor who builds the "skin" houses that bring financial woe to many a workman and produce the fire and social risks of this type of house. Most readers can bring to mind some cities where this type of building makes a blot upon the landscape and constitutes a menace to the city's welfare.

Where Shall Capital Be Secured?

It is evident that a large source of invested capital of the future will come in the form of small investments from the working classes. Out of the national thrift movements of to-day will come a large measure of education that will make our workmen approach the thrift standards of the French working classes. Out of the large earnings will come some hoarding of liquid funds. The investment on a thoroughly business-like and honest basis of capital in a development of well-built homes in a carefully restricted environment will afford the workman one of the best forms of investment that can be offered him. A large proportion of the initial cost can be divided into shares or bonds and the workmen can readily be taught to invest in these shares or bonds. The Clark bill calling for a housing appropriation of $50,000,000 (before Congress as this is written) will furnish a stimulus to industrial housing projects which will bring this whole housing movement into prominence.

Manufacturers, because of their great economic interest in better homes, should take over such elements of risk as may enter into the scheme and should underwrite or otherwise guarantee the bonds to be sold so that the deserving workmen who desire to take advantage of this method of saving may have a secure investment with the speculative element eliminated. The permanent investment plan only goes with the permanent dwelling in a housing project. It is fair to the new investor to give him the same opportunities which older investors always demand, namely, liquid character of the investment. The investment must be immediately convertible into cash at any time. Bonds in such a project—home bonds, they may well be called—can be made liquid if they represent approximately 75 per cent of the cost of dwelling and are secured by a sinking fund which will retire the bonds in a number of years consistent with the life of the dwelling.

It is the employers' duty to see that such building is done with the economies that come from construction in a wholesale way and that it is carried out with the same intelligence and high principles as are introduced into the erection and equipment of a factory or power plant. A plan founded on this sound basis enables the more youthful families to save, while living in the group dwellings, toward the individual dwelling they will want when the children of the family become of the school age. It has many protective features that excel the cooperative bank plan now popular with the working classes.

Financing the Permanent Dwelling

Permanency of structure and permanency of style are prime essentials in any such housing

scheme. The houses so far built by the Bridgeport Housing Co. have been constructed of brick, a favorite New England building material. Concrete may be used in some part of the later development, but the scarcity of architects and artisans familiar with concrete construction is a limiting factor now. Simplicity of line and adherence to styles that have long been satisfactory in New England mark the work of the architects. Styles that have persisted through a period of more than 100 years are likely to be good fifty years from now and that is the aim of this development.

In England projects of this kind are frequently planned to be written off in 80 years, such is the permanency of the construction. The Bridgeport houses are so built as to permit of extending the period of amortization over at least 25 years, and over a much longer time if desired. The need for a prompt return, that is usually a part of purely speculative building, is eliminated. The use of permanent materials, careful construction and long-term restrictions will prevent a probability of the property's going back in value to any marked extent —indeed, the growth of the community will probably enhance the value of these carefully selected tracts and the homes thereon.

At present the homes are all rented and a long waiting list gives evidence of their desirability. As the company expands its operations it will sell the detached houses on some installment plan, incorporating therein such features, like group insurance, as have been determined to be of mutual value to buyer and seller. Much consideration is being given to the plan of selling bonds of the enterprise to tenants and other workmen which can later be exchanged into equities in the detached homes. It is believed that this plan will prove so attractive to the workingmen of the city that a large fund can be created to expand the work of the company.

If the investment is amortized on a basis of paying 5 per cent for unpaid balances, it requires a payment of $110 a year on each $1,000 invested to write off the principal in thirteen years. If the time is extended to twenty-six years it requires but $70 a year. If houses are so built that there is no decrease in their value in the longer period, there is no necessity to amortize at a more rapid rate.

During this war period all the functions of social relations are being tested. The classes and the masses are studying the problems arising out of the stress of rapidly changing conditions. The broad-minded manufacturer looks askance at an economic condition or habit that makes the worker pay out from 20 to 25 per cent of his wage for rent from which he gets no permanent return. All over the country the movement toward the Americanization of foreign-born workers is gaining strength. The effect of acquiring title to real estate is probably one of the most forceful influences for the betterment of the workers and for the upbuilding of a higher civilization. If we have reached a condition in our social life where one class must take care of another class we have reached a danger point. Our employers should see that such a condition be made but a temporary one.

The people must pay for the houses that are to solve the home problem of industrial workers—but the workers cannot pay all cash. The investing class must enter into the problem with its funds for a time. The wage earner can pay over a long period of years proper charges for the proper house. Otherwise his wage is wrong and will be corrected. We have taught the worker to invest in national bonds. If we can teach the worker to continue to keep on buying bonds, we can help him to own his home. It becomes the manifest duty of the employer to underwrite these bonds and to guarantee their security. The duty and the responsibility of the employer can be expressed in three simple statements:

1. The capitalists who now have the money of the country in their own hands can dictate whether the class of home owners shall be enlarged or not, unless manufacturer and laborer co-operate to establish a new order of things which will eliminate landlordism.

2. We are in a changing period of history in this country and citizenship is a supreme demand of the future.

3. It is unfair to the man who has been taught to buy Government bonds to offer him a share in anything that is not safe and liquid.

Even in the Winter the Lordship Development Has Its Charm

Electric Furnace Installation

Precautions to Be Observed in Promotion Work and the Selection of the Unit—Adaptability to Currents—Grouping Accessory Equipment

BY THOMAS ROBSON HAY*

ONE of the most significant industrial growths of recent years has been the progress made in the development and use of the electric furnace, especially for producing high-grade steels. This development has been due primarily to the possibility and ease of producing high-quality steels at costs much lower than with the crucible process; and also to the possibility of producing steel that is generally superior in grade to converter and open-hearth steels.

Increasing Use of the Electric Furnace

On July 1, 1913, THE IRON AGE reports that there were only 19 electric steel furnaces in use in the United States and three in Canada. It estimates that on Jan. 1, 1918, there were 233 furnaces in this country and 36 in Canada employed in the production of electric steel. In the period, Jan. 1, 1917, to Jan. 1, 1918, the total for the entire world increased from 471 to 733. Accurate estimates and tables of electric furnace installations are out of the question, so numerous have they become, and more furnaces are continually being planned for. Figures for the Central Powers are, of course, liable to error, as there are no accurate data available. The foregoing, however, will give some conception of the growth, accelerated by the war's insistent and continuous demands for increasing quantities of high grade steel.

The electric furnace, like the electric motor, in a great measure owes its successful commercial and economical use to the comparatively recent and rapid growth of modern power distribution systems. With but few exceptions, the power for operating these furnaces is purchased from the central station whose power supply is universally polyphase at 25 or 60 cycles, with delivery at any voltage needed. In furnaces of small capacity, say up to one ton in capacity, single-phase service is permissible. In the large furnaces polyphase supply, involving the use of more electrodes or current conductors, is necessary, as it has been well established that as the capacity of the furnace is increased the number of electrodes should also be increased. There are certain very good reasons why any increase in arc voltage over that nominally used (100 volts) should be avoided.

The principal advantages of the electric furnace over other methods of making steel are:

1. It economically produces the highest temperature obtainable.

2. It offers a ready and easy means of exact temperature control.

3. Any temperature or treatment by slags is possible without contamination of the charge through gases and other impurities.

4. Fusion is effected in a perfectly neutral atmosphere.

5. More rapid steel melting can be accomplished with the electric furnace than with other types available.

Primarily the electric furnace is a refining medium and is not intended to and probably never will compete with the blast furnace for smelting iron ores, although with cheap fuel it has been and is being used to reduce highly refractory metals from the oxides. Without exception it is the best means of producing high-quality steel that is both fine and homogeneous.

Adaptability to a Wide Range of Current

The arc furnace may use either direct or alternating current, but for commercial reasons alternating current is almost exclusively employed, and for the same reason the use of three-phase current supply is becoming more general than that of single-phase. Transmission voltage may be of any value, as it is transformed at the furnace to the voltage required for the melting or heating operation. As the arc is simply an electrical resistance, the working voltage at the furnace terminals depends on the length of arc desired. If the arc is to be confined between the bath and the end of an electrode of considerable area, this arc should be as short as possible, so as to reduce heat radiation to the roof and walls. This is accomplished by the smothering action of the electrode, and at the same time the carbon electrode is kept out of the molten bath. For instance, the usual voltage between electrodes on the Heroult furnace, with two arcs in series, is 50, and this value may be varied about 10 per cent either way, depending on conditions and results desired. Separate transformers for each phase are preferable to a polyphase transformer, as trouble on one transformer in a polyphase connection would not mean a complete shut-down, with consequent loss of all or a part of the charge in the furnace. Single-phase transformers for a polyphase installation, instead of one polyphase transformer, will mean a slightly more expensive installation. It is the usual practice for the transformers to be furnished as an integral part of the complete furnace installation, and the choice between these systems of current transforming need not particularly concern the central station, except insofar as a breakdown of the polyphase transformer will result in a complete loss of revenue until repaired.

The electric furnace is a desirable load for the central station, because it takes a large number of kilowatt-hours at one point with long hours of usage at a comparatively high load factor from the central station after the connection is once made and can be adjusted in its operation so as to be very largely an off-peak load.

Cautions in Promoting an Installation

When the use of an electric furnace is being considered there are three important considerations which should be given most careful attention: (1) Ample finances. (2) Proper conception of the function of the electric furnace. (3) Correct decision as to the proper size and type of furnace.

Many contemplating the installation of an electric furnace go into the matter without having a clear conception of the capital needed to make the operation a success. The result is that the initially

*Duquesne Light Co., Pittsburgh.

available funds are often exhausted before much more than a start has been made. The use of an electric furnace involves the purchase of not only the furnace itself and the building needed to house it, but also, among other items, it must necessitate the purchase of expensive auxiliary electrical equipment, such as electrode control equipment, furnace transformers, copper buses and cables, large high-tension oil circuit breakers, transformers for operating auxiliary equipment, necessary recording meters, etc. Facilities for proper charging of the raw materials to the furnace and for economical and expeditious disposal of the slag formed must also be provided for. In some cases where the electric furnace is to be used in a foundry already in operation, it may be necessary to rearrange the entire foundry floor layout to enable prompt and economical pouring and in order to reduce to a minimum the time and labor costs of pouring. One most important feature, often overlooked or neglected, is the necessity to have sufficient capital in hand, not only to cover the first cost of installation, but also to provide a surplus sufficient to enable the operator to have on hand enough raw stock to permit operation for at least three months. Overhead charges continue whether the plant operates or not.

Expert Knowledge Essential in Selecting Furnace

A correct conception of what an electric furnace will do is a prerequisite to a proper selection of the furnace, both as to size and type. In many cases electric furnaces are used, largely through misconception, to do work that can be performed more cheaply and expeditiously by other means. The increase in the use of the electric furnace has been due partly to the demand for a high grade of steel, partly to the enthusiastic and energetic efforts of those engaged in the development and sale of electric furnaces, partly to a desire on the part of those whose business is increasing to try out the electric furnace, and partly to the desire of every foundryman to be as well or better equipped than his competitor. Often one electric furnace installation has led to others.

The size and type of the furnace installed will be determined largely by volume of output, anticipated increase in sales due to better product, pouring facilities, floor space available, and other related matters. The type of furnace will generally be determined by the production process and the furnace will usually be of the polyphase type.

After the decision to go ahead has been made and the furnace selected, the next matters to be disposed of relate to (1) selection of consulting engineer, (2) correct and proper electrical and mechanical installation, (3) expert attendance.

Calling in the Consulting Engineer

The selection of a consulting engineer is most important. One should be chosen who is qualified by training and experience to advise correctly on the matter in hand. He should preferably have had actual experience in operating the electric furnace, and he should be thoroughly versed in the metallurgical, as well as the electrical features, of its operation. In some cases the consulting engineer has attempted to advise regarding such installations when he was as ignorant of the matter in hand as was his client.

The commercial and operating success or failure of any electric furnace installation, providing the requirements mentioned have been properly fulfilled, will be due in a great measure to proper electrical and mechanical installation.

Details of Installation

The installation of the furnace and its auxiliary equipment, including transformers, switches, busbar structure and connections, electrode regulating and metering equipments, etc., should be made as a unit and should be compact and flexible in assembly. The transformers, switches and metering equipment should be as close to the furnace as possible, in order to reduce the length and amount of copper required. All auxiliary equipment should be protected from splashing metal, fires, etc., by the intervention of a brick wall between it and the furnace. The wall will at the same time act as a support for the heavy busbar connections. Such an arrangement will not affect the cost of installation to any appreciable extent.

Another reason for a compact installation is to reduce the amount of external reactance in the circuit. This reactance, which is in addition to the inherent transformer reactance, is caused by the presence of large masses of steel and iron in close proximity to the electrical circuit. It acts to reduce the usable electrical input to the furnace by decreasing the power factor of the electrical circuit. This in turn very appreciably affects the amount of heat that can be developed in the furnace, causes a reduction in the output, a deterioration in quality, and an increase in production cost.

Particular attention should also be paid to the accommodations for prompt and economical charging of materials and for disposing of slag. If the charging facilities are not adequate to insure prompt handling, this deficiency is very distinctly reflected in the amount of power required, the time per heat and the cost per unit of output. Improper and awkward means of slag disposal also affect these items. The principal factors are lost time and excessive labor and maintenance costs.

Expert attendance is a prime essential to successful electric furnace operation. Two furnaces installed properly and in accordance with the most up-to-date practice may yet differ widely in the results obtained.

The average steel foundry in the past has not been equipped and organized to produce highly satisfactory results from a metallurgical standpoint. The foundryman uses steel merely as an incident in his business. The older methods of producing steel have been to a large extent "rule of thumb." The operation of an electric furnace can be reduced to routine practice with satisfactory results, but this will not be accomplished without careful supervision by skilled metallurgical management. It is not possible for the average foundryman to buy an electric furnace, set it up and start it, like a molding machine. Steel making has its annoyances no matter what method may be used, and it should be realized clearly that the finer the apparatus, the more skillfully must it be operated to attain to excellency of results. It is something like photography. Almost any one can obtain pretty fair results with an ordinary camera. An unusually fine camera will permit of much better results, but the camera itself is only the tool. The photographer must be highly skilled to get the best results out of the finest camera.

An Aid to Small Manufacturer

The electric furnace is a good revenue producer, and in the case of the majority of installations, if

not all, it represents a proper and highly desirable user of central station service, not only on account of the generally favorable operating characteristics, but also on account of the great expense that the user would be put to in installing a plant of adequate capacity sufficient to meet all conditions. For the small manufacturers the use of an electric furnace for the manufacture of ingot steel enables competition at minimum first cost and expense of operation, when using central station service. It puts such plants on practically an equal manufacturing basis with larger plants having greater resources in men and money. The use of the electric furnace when taking power from central station lines may convert the usually idle stand-by equipment of the central station into revenue producing equipment, when such conversion is desirable and advisable, as the off-peak requirements generally specified in contracts for this class of service will make this equipment available in case of need.

Where any considerable number of electric furnaces are being operated on one central station system, the power company and the consumer should co-operate to the extent of adjusting the starting periods in such a manner that the several furnace units will be put into operation at different times, so far as possible, thus producing steadier conditions and enabling the central station to handle the resulting load at the least cost and with minimum disturbance, and therefore at the least cost to the consumer.

Low-Priced Current Now Available

The electric furnace, in the several different types, is now standardized and has come to stay, and that central stations generally are recognizing this fact is evidenced by a willingness to reduce rates to a point that makes it economically profitable to the manufacturer to substitute such equipment for other that may be in use. This reduction in rates to a mutually profitable basis, together with the continued improvements and refinements in the design and operation of the electric furnace, will continue to promote the use of such equipment, taking power from central station lines. In proportion as the central station, the furnace manufacturer and the furnace user co-operate in adjusting conditions to a mutually satisfactory basis, in just such a proportion will this comparatively new field of central station activity continue to be developed and enlarged.

Girod Electric Steel Plants in France

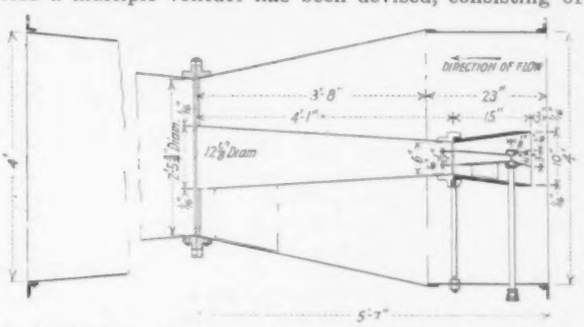
The American Industrial Commission which went to France in 1916 visited one of the largest electric steel plants in that country—the works of the Compagnie des Forges et Aciéries Electriques Paul Girod and the works of the Société Electro-Metallurgique Procédés Paul Girod, which are affiliated establishments at Ugine in Savoy (in the "white coal" region). The first of these is equipped for making electric steel castings up to 25 tons. The six furnaces that were in operation have an aggregate charge capacity of 35 tons. Two more furnaces were under construction, one of 2 tons, and one of 12 tons, which will make the aggregate charge capacity 47 tons. Each furnace can be used for making at least three heats per day and each heat requires about 6½ hr. With the six furnaces already in use there was no difficulty in making 3000 tons of electric steel per month, or an average of 100 tons per day.

The Jacobson Machine Mfg. Co., Warren, Pa., has changed its name to the Warren Machine Products Co.

Venturi Meter for Centrifugal Blower

In a paper presented before the American Society of Mechanical Engineers at its annual meeting in New York, Dr. L. C. Loewenstein, engineer General Electric Co., West Lynn, Mass., described adaptations of the venturi meter and the impact float method of measuring air to the regulation of air delivered to blast furnaces by centrifugal compressors. The following is from his paper:

Both the venturi meter and the impact float methods of constant-volume governing applied to centrifugal compressors delivering air to blast furnaces have resulted in improving the regulation of the furnaces. An ordinary venturi meter in which the entire quantity of air flowing must be drawn through a sufficiently small throat to give a suitable drop of pressure would involve considerable power loss. To reduce this power loss a multiple venturi has been devised, consisting of



Triple Venturi Meter Used for Measuring and Regulating Discharge of a Turbo-blower

a number of concentric venturis. Referring to the figure showing a multiple venturi, a very small part of the total air flow passes through the small or inner venturi. At the throat of this small venturi the largest pressure drop is obtained. A larger quantity of air flows around the inner venturi and through the second venturi, but the bulk of the air flow is around the second and through the third or outer venturi. The loss of power in metering the air through this triple venturi, when passing 45,000 cu. ft. of standard air per minute is 0.18 hp. for the smaller or inner venturi, 1.06 hp. for the middle venturi and 31.38 hp. for the outer or largest venturi, making a total power loss through the entire triple venturi of 32.62 hp.

The largest drop of pressure in this triple venturi meter occurs in the throat of the inner or smallest venturi. With a flow of 45,000 cu. ft. of standard air per minute, the calculated drop is 7.28 in. of mercury (3.57 lb. per sq. in.) pressure. With air entering the meter from atmosphere the throat pressure will be negative (suction). With varying flow of air through the venturi the suction at the throat of the inner venturi will also vary; and this varying suction can be used for governing the driver of a centrifugal compressor so as to hold a definite constant volume of air flow per minute.

Labor Troubles at St. Louis

A number of small strikes in plants handling Government work in St. Louis have been started during the past two weeks, notably in the Wagner Electric Co.'s plant, that of the St. Louis Car Co. and also chemical plants making acids, etc., for the Government. At the Wagner plant, which is making heavy shells and also other equipment between 1000 and 2000 men have gone out. At the St. Louis Car Co.'s plant, which is making gun carriages and is about to begin the assembling of airplanes, about 600 men are disaffected. At the chemical plants, similar numbers of men are out or threatening to go out. The strikes have developed very suddenly and have been put in effect in a manner to indicate lack of the organization necessary to formulate specific demands and present them in a formal manner. The consequence is a belief that the strikes have been started by influences hostile to the Government and investigations are under way to determine whether this is the fact.

Cost-Plus-Profit Contract Is Commended

Council of National Defense Proposes It with Safeguards for Large Amount of Construction Work — Major Starrett's Statement

WASHINGTON, March 19.—Notwithstanding the fact that Congress has come to look with disfavor upon the so-called cost-plus-profit form of contract and has even gone so far as to initiate prohibitory legislation in connection with the $50,000,000 housing project for munition plants embodied in the Clark bill, the Council of National Defense continues to regard this form of agreement as affording adequate protection for the Government provided it is hedged about with certain safeguards and defends it vigorously in a statement issued by the Emergency Construction Division of the War Industries Board. So thoroughly is the council satisfied with the cost-plus-profit basis that it has framed a standard contract intended to be used in connection with nearly half a billion dollars' worth of construction work to be executed within the coming 18 months, including 31 storage warehouses at interior points costing $100,000,000; six seaport terminals, $90,000,000; two Government-owned powder plants, $100,000,000; buildings for the Signal Corps, $50,000,000, and several plants for the production of high explosives and gases, $100,000,000.

Features of New Contract

The chief features of the new contract, which have been worked out by experts based on the past year's experience in all kinds of construction work, embrace a schedule of items which may be included as costs, a graduated scale of fees, stipulations reserving the right to terminate contracts, provisions regarding hours of labor and a schedule of rental rates which contractors will be permitted to pay for the use of heavy equipment. While designed to be fair to contractors, the terms of these new agreements are much less favorable than the contracts under which have been built the cantonments and numerous other buildings erected since the United States entered the war. The schedule of fees, especially, has been heavily pruned and sub-contractors have also been brought under close restrictions.

The cantonment contracts were based on a maximum profit allowance of 10 per cent for the smaller contracts grading down to an upset figure of approximately 7 per cent on jobs amounting to $10,000,000 or more. On the basis of this schedule the experts of the Emergency Construction Division believe the contractors were liberally but not extravagantly compensated. Experience and the acquisition of a large amount of equipment are factors which may now be taken into account; hence it has been decided to cut maximum compensation to 7 per cent on contracts of $100,000, or less, and to scale the profit down on larger sums to a flat figure of $250,000, or 2½ per cent, on $10,000,000 or over.

For the purpose of closing a gap which was opened rather widely in some of the contracts heretofore made, it is especially provided in the new form of agreement that the fee received by the contractor upon all work sub-contracted by him to other parties shall be 2½ per cent, irrespective of the profit that may be made by the contractor or the ratio which the sub-contract bears to the original contract. The fee for reconstructing and replacing any of the work that may be destroyed or damaged is to be determined by the contracting officer representing the Government, but shall not exceed 7 per cent.

Schedule of Expenditures

Much attention has been given by a corps of cost accountants to the framing of the schedule of items which contractors will be permitted to include in figuring costs as the basis of their profits. The schedule of actual net expenditures made in the performance of the work, which the Government will recognize, include the following:

(a) All labor, material, machinery, hand tools not owned by the workmen, supplies and equipment, necessary for either temporary or permanent use for the benefit of said work.

(b) All sub-contracts made in accordance with the provisions of this agreement.

(c) Rental actually paid by the contractor, at rates not to exceed those mentioned in the schedule of rental rates hereto attached, for construction plant, and rental to the contractor for such construction plant or parts thereof as it may own and furnish.

(d) Loading and unloading such construction plant, the transportation thereof to and from the place or places where it is to be used in connection with said work, the installation and dismantling thereof, and ordinary repairs and replacements during its use in the said work.

(e) Transportation and expenses to and from the work of the necessary field forces for the economical and successful prosecution of the work, procuring labor and expediting the production and transportation of material and equipment.

(f) Salaries of resident engineers, superintendent, timekeepers, foremen and other employees at the field offices of the contractor in connection with said work.

(g) Buildings and equipment required for necessary field offices, commissary and hospital and the cost of maintaining and operating said offices, commissary and hospital, including such minor expenses as telegrams, telephone service, expressage, postage, etc.

(h) Such bonds, fire, public liability, employers' liability, workmen's compensation and other insurance as the contracting officer may approve or require and such losses and expenses, not compensated by insurance or otherwise, as are found and certified by the contracting officer to have been actually sustained by the contractor.

(i) Permit fees, deposits, royalties and other similar items of expense incidental to the execution of this contract, and necessarily incurred.

(j) Such proportion of the transportation, traveling and hotel expenses of officers, engineers and other employees of the contractor as is actually incurred in connection with this work.

(k) Such other items as should in the opinion of the contracting officer be included in the cost of the work.

Rule as to Freight Charges

The fact that the Government has taken over the railroads has evidently been in the minds of the framers of the new contract in view of certain stipulations concerning transportation charges. The Government reserves the right to pay directly to common carriers any or all freight charges on material and machinery furnished under these contracts and certified by the contracting officers as being for installation or for consumption in the course of the work, and while it is agreed that the contractor shall be reimbursed for such charges of this character as he may pay, such items are not to be embraced in the schedule of expenditures upon which the profit is figured. Freight charges paid by the contractor for transportation of construction equipment, construction plant, tools and supplies may, however, be treated as part of the cost of the work upon which the contractor's fee is based, provided that charges for such transportation over distances in excess of 500 miles shall require the special approval of the contracting officer.

Result of Experience

The experience of the Government at Hog Island and on one or two other large jobs is understood to have suggested the provision included in the new contracts to the effect that no salaries of the contractor's executive officers, no part of the expense incurred in conducting the contractor's main office or regularly established branch office, and no overhead expenses of

any kind, except as specifically listed above, may be included in the cost of the work, nor shall any interest on capital employed or on borrowed money be taken into account. Contractors are also required to take advantage to the extent of their ability of all available discounts and must report to the representatives of the Government their inability to do so whenever such case arises.

With a view to preventing contractors from exploiting their workmen through the establishment of company stores, etc., it is provided that all revenue from the operations of "commissary, hospital or other facilities, or from rebates, refunds, etc.," shall be accounted for by the contractor and applied in reduction of the cost of the work.

May Cancel Contract

A drastic provision permitting the Government to terminate contracts is included in the agreement. Should a contractor at any time "refuse, neglect, or fail in any respect to prosecute the work with promptness and diligence, or default in the performance of any of the agreements" contained in the contract, the Government may at its option, after five days' written notice to the contractor, terminate the contract and may "enter upon the premises and take possession for the purpose of completing said work, of all materials, tools, equipment and appliances, and all options, privileges and rights, and may complete, or employ any other person or persons to complete said work."

The eight-hour law of June 19, 1912, is embodied in the contract, but is qualified by the proviso that it shall not be enforced against an executive order suspending its provisions or in the face of any "extraordinary events or conditions of manufacture or any emergency caused by fire, famine or flood, by danger to life or property, or any other extraordinary events or conditions on account of which by subsequent executive order such past violation shall have been excused."

Schedule of Rentals

For the purpose of placing limitations upon expenditures for rented equipment the new contracts prescribe a schedule of maximum and minimum rentals, the exact figures in each case to be fixed by the contracting officer with due consideration of sizes, capacities, conditions and fair market value of equipment. This schedule is as follows:

	Per Day
Automobiles	$2.00 to $8.00
Buckets, tipple, bottom dump, orange-peel, clam-shell, etc.	.50 to 2.00
Boring machines, power driven	.20 to .75
Backfillers, power driven	2.50 to 10.00
Boilers, upright and horizontal	1.50 to 6.00
Cars, steel or wooden, contractors'	.40 to 2.00
Compressors	1.50 to 8.00
Derricks, with or without power	.50 to 20.00
Dirt spreaders	2.00 to 15.00
Engines, skeleton, with or without slewing gears	2.00 to 5.00
Engines, traction	2.00 to 15.00
Instruments, engineering	.25 to 1.00
Locomotives, narrow or standard gage	5.00 to 25.00
Mixers, with or without power, equipped with loaders or not	1.00 to 8.00
Motorcycles	.25 to 1.00
Motors, electric	.25 to 8.00
Pumps, with or without power	.50 to 6.00
Pipe machines, with or without power	.50 to 6.00
Pile drivers, drop, steam-hammer or jet, with or without power	.50 to 25.00
Plows, not car unloaders	.25 to 1.00
Rollers, horse or power	.50 to 15.00
Scrapers, slip or wheel	.25 to 1.00
Saws, power	.25 to 5.00
Steam shovels	10.00 to 30.00
Skips, steel or wooden	.10 to 1.00
Trench diggers	10.00 to 30.00
Trucks, motor	1.00 to 25.00
Wagons	.25 to 1.00

The transfer or subletting of these contracts is forbidden and no sub-contract may be entered into without the approval in writing of the contracting officer representing the Government. Violation of this provision will operate to cancel the contract.

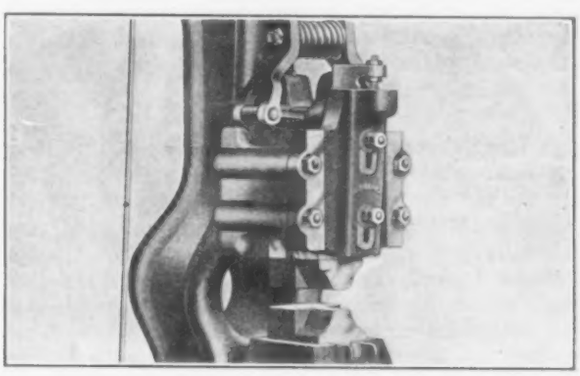
Percentage Plan Praised

In an official statement in support of the fairness of the new contract, Major W. A. Starrett, chief of the Construction Division of the War Industries Board, says that the percentage contract has been a success "because it was well conceived; because it gave the contractor a fair but only a fair profit; because it obtained for the Government at a minimum cost the service that the contractor was able to render and which the Government was in no position to render itself." The Government in all cases so far has obtained good value for all expenditures. Major Starrett also points out that the maximum fee of $250,000 which may be received under the new contracts is not all profit, as the contractor must pay his own overhead costs and will rarely make more than 3 or 4 per cent profit. Several contractors who built cantonments found their overhead to run as high as $100,000, which would leave but $150,000 apparent profit under the new agreements. Even this sum, however, would be very substantially diminished by corporate income and excess profits taxes and in addition, if any considerable part of the net gain goes to the income account of any one stockholder, the Government will again take a part as personal income tax. In conclusion Major Starrett asks if anyone can say that "the use to the Government of a great going business organization that costs anywhere from $100,000 to $300,000 a year to run is not worth the modest net amount here indicated on an operation where skill, experience, teamwork and business ability in large affairs can easily be made to count for literally hundreds of thousands of dollars of saving."

W. L. C.

New Face Plate for Power Hammers

The United Hammer Co., Oliver Building, Boston, is now equipping all of its power hammers with a face plate and an adjustable bronze taper gib. This arrangement is relied on to enable the wear in the ram guides to be taken up and it is pointed out enables a finer ram adjustment to be secured than was formerly possible.



A Face Plate with an Adjustable Bronze Taper Gib to Compensate for Wear Has Been Substituted for the Straight Face Plate with a Wood Filler Formerly Used on a Line of Power Hammers

The former arrangement employed a straight face plate with a wood filler between the two surfaces and it is explained that when wear occurred in the ram guides this plate would have to be loosened, some of the packing removed and the lost motion taken up in that way. This adjustment was, of course, somewhat clumsy and in addition it is emphasized was limited in its range and accuracy.

In designing the face plate and the gib the construction has been made such as to enable them to be fitted to the hammers which are now in use.

D. Fechheimer has opened an office at 20 East Jackson Boulevard, Chicago, where he will conduct a business in buying and selling scrap iron and steel, relaying rails, and also deal in railroad supplies and metal products. Mr. Fechheimer was for 23 years connected with the Joseph Joseph & Bros. Co., having served that company in various capacities and in various cities.

The Atlantic Steel Co., Atlanta, Ga., has obtained a license to use the Orth roof for open-hearth furnaces, manufactured by Frank Orth, Indiana Harbor, Ind.

The Manufacture of Steel Sheets*

What Is Necessary in Galvanizing, Pickling, Packing and Weighing—Six Finishing Mills the Minimum Number for Success

BY CLEMENT F. POPPLETON

GALVANIZED sheets are ordered C. R. C. A. flat, which means cold rolled, close annealed, for working up; C. A. corrugated, the ordinary good corrugated sheet; corrugated without further specification, which means that the sheet must stand corrugating and curving to an ordinary radius.

The process of manufacture is left entirely to the maker, but for reasons of good business policy it is better to make all corrugated sheets of standard quality, close annealed.

The above are the ordinary commercial specifications for galvanized and galvanized corrugated sheets. In addition there are large orders for railroads, governments, etc., which are subject to special specifications and inspection, but if the processes of manufacture outlined in the foregoing article are carried out thoroughly the black sheet will pass all the physical tests required by the most rigid of these specifications; the chemical requirements will of course have to be taken care of at the steel works.

Galvanizing

The hot process of galvanzing is more generally used and is better liked for sheets, as it gives a better appearance to the finished product than the electric method. It consists of dipping the sheet in a bath of molten spelter, which adheres to the prepared sheet. The sheets were literally dipped, but in modern practice they are fed through rolls. If the order calls for cold rolling, they are cold rolled, as before described, and thence go to the pickling vats. If the sheets are C. A. corrugated, they go direct to the pickling vats.

The pickling process consists of immersing the sheet in a solution of sulphuric or other acid and water and either agitating the sheet or the acid mixture. The purpose of this is to clean the sheet of grease, oxide, scale or other impurities and to leave a slightly roughened surface.

One of the most important parts of the whole process of galvanizing is pickling. If a sheet is over-pickled it will present a grey appearance after coating instead of the bright spangled appearance so much desired, and, further, it will take up more spelter, thus making a more expensive sheet and a less saleable one.

On the other hand, if the sheet is not thoroughly cleansed, it will not take the coating where the uncleansed parts occur, leaving black spots on the finished sheet, making a waster out of it.

The pickling vats used in modern practice are made of pitch pine, about 20 ft. long, 6 ft. wide and 3 ft. deep, with about 4 ft. partitioned off at one end; in this space the agitator works, and this is so arranged that it keeps the acid and water in constant motion in between and around the sheets, which are put into the vats in batches by means of a crane or by hand if so desired.

There is a second tank exactly similar but filled with water only; into this second tank the sheets are placed by crane and thoroughly rinsed clear of acid. It is important that this water tank be kept clean and the water changed frequently.

There are many other methods of mechanically pickling sheets, all commercially successful. Some vats have sides partitioned off and the agitator works in this space, with the same ultimate result. The Mesta pickling machine, described and illustrated in the author's article on tin plate (THE IRON AGE, Jan. 3, page 34), is also made in sheet sizes and is an excellent method. From the pickling until the sheets are packed it is a matter of individual handling. A very rigid inspection is necessary after pickling. After inspection the sheets are placed in a storage tank filled with water placed immediately behind the galvanizing bath.

The galvanizing bath is a heavy plate steel tank about 8 ft. square by 5 ft. deep; round this is the firepot, coke being the usual fuel, although natural gas has been used with success in America. The fire is not allowed to impinge upon the corners of the bath, nor does it pass under the bottom. The coating material is spelter. Commercial spelter is a mixture of zinc, lead and tin, and under heat this stratifies, that is to say, the lead will separate and settle at the bottom of the bath; next comes a layer of dross, of which more anon; next a layer of zinc, and on top of all a thin layer of tin.

The most generally used galvanizing machine consists of three pairs of rolls and guides. The feed rolls are placed at an angle over the entering flux box. The next pair of rolls are entirely submerged in the bath and vertical; the third pair are half submerged and horizontal; suitable bar guides are placed between each set of rolls. Immediately behind the feed rolls and contiguous to the storage tank is a solution tank; this, as its name implies, contains a weak solution of acid and water. Its function is to cleanse the sheet finally of any oxide, etc. From this solution tank the sheets are fed singly into the feed rolls, from which they pass into the flux box. This flux is a mixture of muriate of ammonia (sal ammoniac) in crystal form and tallow; a little crude glycerine improves the lasting quality of the flux. The economy of its use depends upon market conditions.

The sheet passes through the flux box down under the metal, where it is gripped by the submerged rolls, which by their position change the direction of the sheet, and it travels upward to the horizontal rolls. The functon of these rolls is twofold, first to carry the sheet forward, and, secondly, to finish the coating, squeezing the spelter into the sheet and also squeezing the surplus spelter off the sheet. After passing these finishing rolls the sheet is turned over onto a chain conveyor and runs out to the cooling racks. These are of different designs, the most generally used being the wheel. This is a series of spokes, each one of which takes

*Second and concluding part of article begun on page 676 of THE IRON AGE of March 14. The author has designed numbers of plants in this country and abroad and contributed a comprehensive article on tin plate mill design in THE IRON AGE of Jan. 3, 1918.

a sheet. The sheets are thus held apart and a current of air plays through the wheel.

After cooling the sheets are inspected for final defects. These consist of flux spots, caused by the entrance flux being allowed to become dead. Black or uncoated places are caused by defective pickling, as mentioned under that head; gray sheets are caused by over-pickling; flux stains are caused by dead flux being dragged around the finishing rolls. These sometimes cover a whole sheet. For gray sheets there is no remedy. They are not necessarily defective except in appearance. Flux spots may be scraped with a scraper and the sheet redipped. Black spots should be scraped clean and bright, swabbed with a strong solution of sulphuric acid and the sheet redipped. Flux stained sheets should be returned immediately and redipped.

Dross and Other Losses

The galvanizing bath needs a certain amount of care to obtain commercially successful results. Dross is perhaps the greatest individual source of loss. Dross is a combination of steel particles, in a very fine state of subdivision, and spelter, burnt or workable. The melting point of spelter is about 700 deg. Fahr.; that of steel 2800 to 3000 deg. The working temperature of the bath should not exceed 900 to 1000 deg. Fahr. Spelter burns so as to become useless at about 1200 deg. The presence of the rolls in the bath of course adds to the dross, as they are constantly wasting and giving off particles of steel. The steel (machinery) and dross in the pot will absorb more heat than will the zinc and tin, and the more dross there is in the pot the more spelter will become burnt; hence the saying, that dross makes dross.

It is important that the dross should be taken out of the pot not less than once a week. This is accomplished by means of a drossing spoon made to take a charge of 200 lb. handled by crane; the spoon is forced by hand into the lead at the bottom of the pot and then lifted by crane to the surface. It is perforated on bottom and sides, and the lead and good spelter drip out and off the top. The dross is then placed in moulds and either sweated in a furnace to recover a portion of the spelter or else is sold to the spelter works. This is a matter of works management. The value of dross depends directly on its spelter contents, and as a consequence it is a matter of figuring on the ground as to whether the recovered spelter pays for the labor and loss in price on the balance of the dross.

Lead is removed by a lead spoon, which is of about 25 lb. capacity, and is set at right angles to its handle. It is operated by hand; being forced down through the superimposed layers of tin, zinc and dross, it fills with lead and then is slowly lifted to the surface. Owing to the greater specific gravity of the lead, the dross, spelter and tin float off and almost pure lead is the result. Leading should be done about every two weeks, as if allowed to accumulate, it floats the dross into the working level, where this adheres to the sheets and spoils the product.

The cause of loss second in financial importance is oxidation. Zinc, particularly, in a molten state, has a great affinity for oxygen, and the pot must be kept covered. Coke dust and sand have been used for this purpose, but the best covering is spent flux. The dipper should dip his spent flux out of the flux box and spread it on the remainder of the exposed surface of the metal. Certain losses from oxidation always occur, particularly where the moving parts of the drive enter the bath. The loss on zinc ashes is greater than that on dross, but there is not such a large quantity produced.

Corrugating

After cooling and inspection, the galvanized sheets are ready for shipment if ordered flat. If they are ordered corrugated, they are taken to the corrugating machine. In the United States corrugating is almost universally done in corrugating rolls. These machines consist of corrugated rolls, the corrugations running lengthwise of the rolls, and are made about 12 ft. between the housings.

The English system consists of a stamping press which has male and female dies; these stamp about three corrugations at a time, and the sheet stepped over one corrugation always acts as a guide for the next. The bottom die is absolutely rigid, and, owing to the deep-curved section of the top moving die, there is practically no spring in the dies. The lighter gages are corrugated in packs of two or three sheets.

If the sheets are plain corrugated they are now ready for packing. If they are to be curved they next go to the curving rolls.

The curving rolls consist of two housings and three rolls in a pyramid. The rolls are capable of being changed, and are, of course, machined off the same templets as the corrugating dies. The two bottom rolls are fixed relative to the housings, the upper one being adjusted by a screw and screw box. The upper roll is lifted and the sheet passes between the three; the amount of pressure exerted on the top roll by means of its screws determines the radius of curvature.

Packing

The sheets have now passed through the final stage of manufacture and now receive the final inspection before packing.

There are five principal methods of packing sheets. First, for short shipments, in bundles; these weigh either 1 cwt. or 2 cwt. The sheets are weighed together with the bands. The bands are of hoop iron, usually 1¼ x No. 18 gage; the bands are cut 2 in. longer than the width of the sheet and are turned over a pointless tool much like a wide key drift. This tool is used to prevent injury to the edges of the sheets. After the turn is made the bands are closed down tight. Two bands are used for sheets up to 6 ft. in length; three for sheets 6 to 10 ft. and four for sheets over 10 ft. For corrugated sheets in bundles corrugated bands are sometimes specified. It is impossible to corrugate bands and leave flat ends in corrugating rolls, but it can readily be accomplished in a press.

Bundles are hardly ever used for overseas shipment; instead cases of four kinds; skeleton; skeleton, felt lined; close; close, felt lined.

Skeleton cases, in fact all cases, are of two weights, 5 cwt. net and 10 cwt. net. Skeleton cases are made of a frame of ⅞-in. lumber, spruce in England, cotton wood or hemlock in the United States. The depth of this lumber varies with the size of the sheets, as the net contents must not vary from the weight called for. For the overseas markets they have top and bottom end boards ⅞ x 6 in. and either three or more ⅞ x 4-in. battens; the corners and battens are clipped with light galvanized scrap clips (cut from waster sheets).

The same remarks apply to skeleton felt-lined cases, except that the side frames are deeper to accommodate the felt. The felt is ordinary tarred felt. It is wrapped around the sheets and tarred at ends and seams—the ends being folded like an

envelope. Close cases are skeletons, but instead of having battens and spaces they are boarded up completely top and bottom. Close cases are clipped on the corners and two clips on each side for 6-ft. cases; three clips on each side for 7 and 8-ft. cases; four clips for 9 and 10-ft. cases.

Overseas shipments are nearly always felt lined; 10 cwt. cases go to the Australian and Cape markets only, except in special railroad or government orders. The Chinese market takes close felt-lined cases of 5 cwt. The average price in England for skeleton felt lined 5-cwt. cases was 10s. per ton and 12s. 6d. for close felt-lined, extra over the price of sheets. These of course were based on ante-bellum conditions.

Weighing

The matter of weighing has purposely been left till this time instead of being considered during the progress of manufacture, as the practice varies so much in various works. A track scale should be provided to weigh the bars in. Portable platform scales are the most useful scales for the rest of the work, the capacity of these scales about 30 cwt. to 2 tons for the shear and pickling department and 20 cwt. for the packing.

The best practice is to weigh bars to furnace, a refinement which may be omitted, but is advisable in a new plant to determine furnace losses, etc., weighing sheared sheets and scrap.

It is necessary to weigh frequently about 2 tons of black sheets before pickling, to weigh them after pickling and then weigh after galvanizing. These sheets should be marked with a steel stamp and should be allowed to go through from the galvanizing pot, whether perfect or not, allowing the inspection to take place after the check weighing; this is to determine two vitally important questions:

1.—The loss in pickling. This will average 56 lb. per ton with careful management.

2.—The amount of spelter deposited on the sheets.

The difference between the weight of the black sheet delivered to the pickle tank and the weight of the galvanized sheet does not represent the weight of spelter deposited. The spelter yield is expressed in the terms of difference in weight of black and galvanzed sheet plus the pickling loss. Less than 1 ton of sheets tested at a time will not give reliable results, and it is evident that the greater quantity tested the more accurate the results. Sheets, of course, must be weighed in the packing department, and several scales should be provided for this purpose so that several gangs of packers can work at the same time.

Wasters

A certain percentage of the sheets will be wasters, either black or galvanized. The method of dealing with these is largely a matter of market. India and China and other overseas markets take considerable tonnage of mended wasters, that is, sheets that are defective in finish but are watertight. It is customary to solder up holes or replace bad places in the coating with solder. The average selling price of these wasters or seconds is $15 per ton less than perfects of the same grade. The problem confronting the management is whether to accept the first loss and consider the sheets wasters, or whether to spend time and money in the attempt to repair faults or redip the sheets. If there is a ready market for seconds it does not pay to redip. This is a general statement and does not apply to special orders, nor to extra sizes and gages, either very heavy or very light.

The foregoing applies more particularly to galvanized sheets, the scrap of which has little or no value except such as can be used for clips in the packing department. Wasters in the black, although a loss, are not such a great loss. They cost less to make and their scrap value is greater. If they cannot be cut down to a smaller sized good sheet they can be sent back to the open hearth furnace as melting scrap.

The mill as described and illustrated was designed for ordinary commercial product and not for specialties. To operate this mill the following electric overhead travelling cranes would be necessary: One of 35 tons capacity, with 10-ton auxiliary hoist over the hot mills and annealing furnaces. One of 10 tons capacity covering the warehouse and packing. One of 5 tons capacity over the furnace lean-to for sheared bars, coal, &c. This could be replaced by a monorail trolley of 2 to 3 tons capacity.

Experience, and to many would-be sheet manufacturers, very dear experience has taught that the absolute minimum number of finishing mills that it is possible to operate with commercial success is six, and the more that can be operated within limits the cheaper the product per ton. Labor per ton is constant at any one period, material the same, selling cost is less when more product is handled, and the greatest of all, overhead charges, are at all times on a constantly rising scale.

Licenses for Coal and Coke Dealers

WASHINGTON, March 19.—To secure better control of the distribution of coal and coke, the President, by a proclamation issued March 15, has directed that all persons, firms, corporations and associations (except producers and miners distributing their own product and retail dealers) "engaged in the business of distributing coal or coke as jobber, broker, selling agent, purchasing agent, wholesaler, or in any capacity whatsoever," shall secure a license on or before April 1, 1918, which license will be issued under rules and regulations to be promulgated by the President and prepared by the United States Fuel Administrator. The Fuel Administrator is directed to supervise the enforcement of the new license requirement and to enforce the regulation rigidly, including the provision authorizing the revocation of the license of any one who shall violate the regulations and the punishment in accordance with the provisions of the Lever act of any person, firm, corporation or association who, without a license, or whose license has been revoked, engages in any business for which a license is required in the handling of coal or coke.

The determination to license coal and coke jobbers is the result of an investigation undertaken to determine what steps are necessary to secure the equitable distribution of coal and coke under the new system, which will go into force on April 1. Without bringing jobbers under the supervision of the Fuel Administration, it is believed that it will be impossible to regulate producers, especially those who do not attempt the distribution of their own products. With the new license regulation in force, however, the Fuel Administrator will be able to control the entire fuel industry and to prevent the violation of either the letter or the spirit of the rules adopted to prevent a recurrence of the fuel famine of the past winter.

A round house and power plant at a cost of $500,000 is to be erected at Canton, Ohio, by the Wheeling & Lake Erie Railroad. The plans call for a round house of between 12 and 15 stalls.

Argument for Warehouse Extras

The question of extras which should be charged on material distributed from warehouses has been made the subject of an investigation made by the American Iron, Steel and Heavy Hardware Association, of which A. H. Chamberlain, with headquarters in the Marbridge Building, New York, is secretary-treasurer. A summary of the arguments presented on the basis of some 60 replies is as follows:

The practice of the mills in the use of extras is an indication of their necessity. Experience proved that it cost a higher price per ton to produce and sell certain sizes as compared with others which could be handled at minimum cost. Distribution of extras-bearing material is affected by the same considerations as its manufacture. If the mills require their differential, the distributer should get it also.

The distributer does not get a differential on extras-bearing material when charging his customer merely the net mill extra above the base price. By so doing he obviously reduces his percentage of profit, since his cost increases while the net amount of profit remains the same. Such procedure is contrary to the fundamental principles of merchandising.

Instead of being reduced, a distributer's percentage of profit on extras-bearing material should be increased because it represents slow selling stock on which it is impossible to make the turn-over expected on staple sizes which are much in demand. There are many sizes, particularly those carrying the larger extras, which are very slow of sale, but in order to keep his stock complete it is necessary for the distributer to keep a fair tonnage of them on hand. It can be demonstrated that once a year is about the turn-over on a great deal of such stock. To have it readily accessible in the distributer's warehouse is an economic advantage and a necessary convenience to the consumer, but without the extra profit to compensate for his long investment and extra cost of handling the distributer could not afford to carry it.

Most extras-bearing material is in the smaller and lighter sizes and is generally sold in small lots. Thus the average transaction is of trifling money value and without some additional profit there is not enough in it to pay the distributer for the trouble of getting it out, to say nothing of bookkeeping expense, credit risk, probable delivery charges, etc.

Contracts Placed for Railroad Material and Small Cars

The Standard Sulphur Corporation, Detroit, which has mines at Pecos, Texas, has placed a contract with the Orenstein-Arthur Koppel Co., for 12 miles of standard railroad track and all necessary supplies and equipment, the contract price being over $50,000 f.o.b., Koppel, Pa.

The Indiana Tie Co., Evansville, Ind., has placed with the same company an order for 100 small cars used in the creosoting of ties. A similar contract, also for 100 cars, has been placed with the Orenstein-Arthur Koppel Co. by the Shreveport Creosoting Co. which will use the cars at its Louisiana plant.

New High Speed Steel High in Cobalt

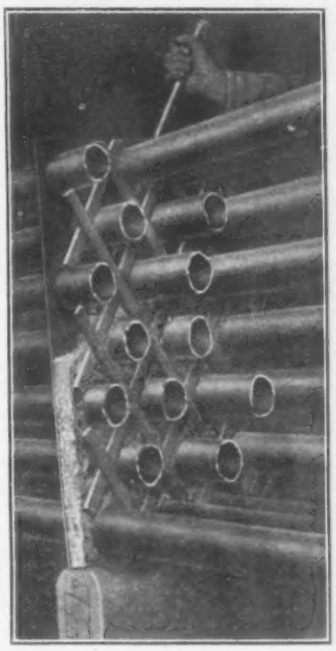
A new high-speed alloy steel, containing a high percentage of cobalt, has been invented. According to a patent (U. S. 1,233,118), which James H. Parker, of Reading, Pa., and B. H. DeLong, of Springmount, Pa., have obtained and assigned to the Carpenter Steel Co. of Reading, the new alloy contains 30 per cent cobalt, besides 2 per cent vanadium, 3.50 per cent chromium and 12 per cent tungsten. The carbon content is 0.35 per cent. While the patent covers a range of composition, the foregoing is stated to have given satisfactory results.

The Ohio Electric & Controller Co., 822 Citizens Building, Cleveland, is now the name of the corporation formerly known as the Cleveland Controller & Mfg. Co.

Boiler Baffles of Plastic Material

As a substitute for baffles for water-tube boilers consisting of tile, bricks or blocks of refractory material fitted in between the tubes, the Betson Plastic Fire Brick Co., Rome, N. Y., has developed a composition of refractory materials which is shipped in barrels in a moist plastic condition ready for use. It is pointed out that with this new material it is possible to secure jointless and gas tight baffles since the coefficient of expansion is so small that expansion and contraction resulting from variation in the temperature are practically eliminated. Where this material is used, it is emphasized, there is no restriction upon the shape or size of the baffle and any form desired can therefore be secured.

In forming a cross baffle for a water-tube boiler of the Babcock & Wilcox type, for example, the cast-iron baffle plate is employed as one side of the mold while the other is formed by thrusting slats into the diagonals between the tubes as illustrated. The plastic material is then poked down through the diagonals to fill the space between the baffle plate and the slats, it being pointed out that it is sufficiently plastic so that it can be forced out around the tubes and fit them snugly. After the work has been done, the boiler is fired up slowly the slats being burned out and the plastic material dried and vitrified in place. It is pointed out that this operation occupies only a few hours after which the full load may be put upon the boiler, and inasmuch as the boiler is operated under full steam pressure before the material is thoroughly set, the expansion of the metal forces the soft material away to the position which it should occupy when the boiler is hot, thus insuring a tight fit between the baffle and the tubes when the boiler is under steam. In forming a longitudinal baffle, blocks of wood are placed between the tubes, above and below the space which it is desired that the baffle should occupy. In this way the plastic material which is shoved in from the sides or the top or bottom of the tube bank is confined in place.



Slats Thrust Diagonally between the Tubes of a Water-Tube Boiler Serve as a Retainer for the Plastic Material of the Baffle and Are Afterward Burnt Out by a Slow Fire Which Dries the Refractory

Other uses of the material are as a substitute for special forms of bricks or blocks, as, for example, where the front headers of horizontal water-tube boilers rest upon the front arch, and for lining furnace and combustion chambers, including the front and rear arches, side and bridge walls, etc.

Machine Tool Builders to Meet in May

The spring convention of the National Machine Tool Builders' Association for 1918 will be held Thursday and Friday, May 16 and 17, at the Marlborough-Blenheim Hotel, Atlantic City, N. J., according to an announcement issued by Charles E. Hildreth, Worcester, Mass, general manager of the association.

The Standard Machinery Co., Commonwealth Building, Philadelphia, has been organized by Charles A. Gehman, who is general manager. Mr. Gehman has been connected with the machine tool business for 20 years.

Preparing for Great Liberty Loan Campaign

Safety Engineer Fonda of Bethlehem Steel Company Emphasizes Importance of Proper Methods in Reaching the Men—Bethlehem and Westinghouse Plan

PREPARATORY to beginning the campaign for subscriptions to the third Liberty loan, Saturday, April 6, plans are being carefully laid by many manufacturers to make the new campaign in every way successful. George T. Fonda, safety engineer of the Bethlehem Steel Co., says that it is not so much the policies adopted as the methods of bringing these policies to the attention of the workmen and the importance of a carefully laid out organization properly prepared and determined to reach the ultimate goal which makes for success in a campaign of this kind. "The results accomplished," says Mr. Fonda, "are bound to be in proportion to the energy put into a work of this kind; and at this particular time every effort should be put forth to bring home to the realization of every individual workman the full importance and necessity of winning the war. And, in winning the war no little stress should be placed upon the individual importance of those who are unable to fight at the front, but who are compelled to remain at home in the industries. Their bit is not only the production of munitions and other materials of war, for it is also rightly their duty to contribute to the funds of the United States Government in making possible the success of the nation across the seas."

Last Bethlehem Campaign

The last Liberty loan campaign of the Bethlehem Steel Co. involved 12 different plants scattered throughout the Eastern and Western states and including about 70,000 workers. Its success was shown by the fact that 94.3 per cent of the men subscribed to the Liberty bonds. "The experience at Bethlehem proved beyond any possible doubt," says Mr. Fonda, "that billions of dollars are waiting for Uncle Sam if someone will only develop the organization to get the proper information to the men."

At Bethlehem it was determined to make a drive for a popular subscription of $5,240,000 among the workmen of the entire corporation, all subscriptions to be obtained during a seven-day campaign. The decision to organize this campaign was made on June 1 and at 6 o'clock Tuesday, June 5, all the machinery was in readiness for the drive. It was this machinery that made the success of the campaign possible.

The responsibility for the entire campaign was assigned to the Bureau of Safety and Welfare, and immediately steps were taken to organize a staff of bond salesmen which would be entirely effective and would reach every individual workman. Representatives from each plant were called to Bethlehem (except the Union Iron Works, of San Francisco), and an organization plan was immediately adopted, based upon the departmental safety committees as a foundation. These committees, being organized for the definite purpose of furthering the interests and welfare of the workmen generally, made an ideal foundation upon which to build up a real "live-wire" organization to get out and get dollars for Uncle Sam.

Separation into Divisions

The final development of the plan was the separation of each plant into divisions. Each division had a captain, and each captain had 10 first lieutenants. Each of the 10 first lieutenants in a division was assigned 10 second lieutenants, making a total of 111 men in each division. At the Bethlehem plant, there are over 26,000 employees, and to canvass these men in accordance with the above plan 15 divisions were organized, which required 15 captains, 150 first lieutenants and 1500 second lieutenants. This same plan was developed in each of the other plants, the size of the organization required being governed by the number of men to be reached.

The second lieutenants made up the real driving force, as each of these men had a list of names not exceeding 20 in any one case; and in each case the second lieutenant had seven days in which to clean up his list. This was comparatively easy, the result being that every man was reached and the Liberty bond issue explained in his own language to his own satisfaction.

The first lieutenants met with their 10 second lieutenants each day at the close of the day's drive (6 P. M.), making a complete report in form to present to the division captain at his division meeting at 8 P. M. each day. Each of the division captains met his respective first lieutenants at 8 P. M. each day, and, aside from receiving the data on the day's campaign, recorded all complaints and questions which the second lieutenants had passed along to their respective first lieutenants in charge. Interpreters were detailed to different parts of the plant, in accordance with reports made to the district captains at these meetings.

Meeting of Division Captains

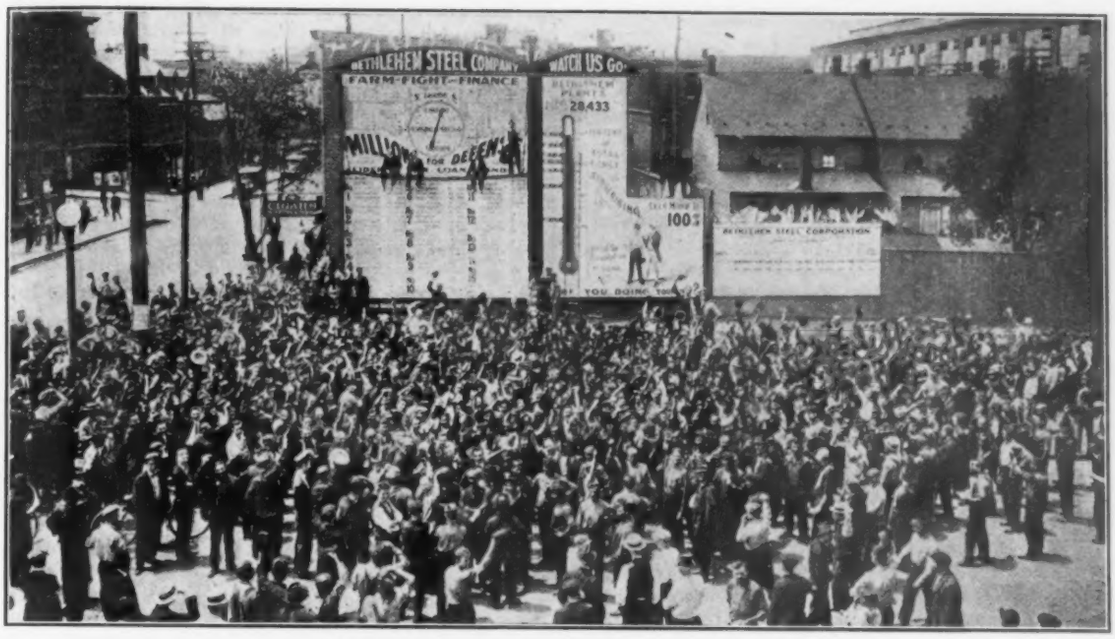
At 8 o'clock each morning the division captains met with the executive committee of the local organization, making a complete report both as to total dollars subscribed to date and percentage of force subscribing. These figures were computed and posted at noon each day on a large bulletin board at the main gate of the plant. The hand on the large dial indicating the number of dollars subscribed to date and the captain whose division made the best record during the previous 24 hours was given the privilege of turning the hands of the dial. On the last day of the campaign there were three captains tied for first honor, and all three helped to turn the hand beyond the $2,000,000 mark, which was the figure set for the Bethlehem plants. The total subscription at Bethlehem was $2,066,950, with the remarkable proportion of 97.8 per cent of 26,314 men subscribing. Other plants of the company also made splendid records.

Great impetus was given to the campaign as a result of a large mass meeting held the night before the big drive started. All of the captains and lieutenants were called together and stirring addresses were made. Mr. Schwab concluded the evening program with one of his typical addresses, which sent all of the workers home determined to put forth every effort to make the Liberty loan campaign an overwhelming success.

The Westinghouse Campaign

Another highly successful campaign was that of the Westinghouse Electric & Mfg. Co., which was inaugurated to obtain subscriptions amounting to $1,500,000 and resulted in subscriptions amounting to $1,610,000 representing 22,000 of the 30,000 employees. Employees of subsidiary companies subscribed about $620,000 and the company itself for $2,500,000, which made a grand total for the company of approximately $4,730,000.

With the hearty approval and co-operation of the management the employees divided the immense works into 18 sections, with a captain over each. They, in turn, selected their own lieutenant and teams. This sales force, embracing many salesmen of experience, aggregated approximately 400 employees and made an enthusiastic as well as systematic canvass of each and every employee of the company. In many cases the sections reported 100 per cent subscriptions; in other words, every employee in the section subscribed. In several cases, where the office boy or some other employee whose remuneration did not in his opinion justify



Photograph Taken at Noon on Last Day of Campaign, Showing a Group of Workmen Cheering in Front of Bulletin Boards After It Was Announced that the Total Subscription of $2,066,950 Had Been Reached, and That the Proportion of Men Subscribing Was 97.8 per Cent

purchasing a bond, the employees of this particular section chipped in and purchased a bond for him.

The progress of the campaign was thoroughly advertised to the employees by means of large wooden thermometers installed at the various entrances to the works which would be moved up each day to indicate the number of bonds subscribed to that time. Placards were also printed daily, giving the total amount subscribed up to the previous day.

The Third Liberty Loan in Cincinnati

CINCINNATI, March 18.—The program for marketing the third Liberty loan issue has already been tentatively agreed upon by the manufacturers and business men in this city. The plan will be patterned after the one adopted during the second Liberty loan campaign, and one which led to a large over-subscription of that issue.

The committee in charge first requested all manufacturing plants and other large employers to each appoint some employee who should devote his entire time to the sale of Liberty Bonds. The idea was almost universally carried out by the employers. In machine tool plants, for instance, a special desk was provided for the bond salesman. He was provided with suitable literature to be handed out, and also placards for posting around the factory. The co-operation of the superintendent and different foremen, as well as of gang bosses, was enlisted. The bond salesmen were specially instructed that no argument that might be considered coercive should be used with the workmen, and the wisdom of this is emphasized by the large number of voluntary subscriptions received from the small investors. The convenience of the plan for subscribing and also for making future payments seemed especially to appeal to workmen.

At Liberty loan headquarters a live man, having a wide acquaintance in manufacturing circles, was stationed, and he made telephone engagements with the different plants for four-minute speakers to address their employees. In most cases these talks were made on company time. Similar arrangements were also made with department stores and other large employers for the speakers who donated their time to the cause.

All subscriptions for bonds were delivered to Liberty loan headquarters. This was found necessary in order to avoid duplications.

A change in the previous campaign will be in dividing the city into different districts that will be in charge of various teams. Each team had a captain and two lieutenants, and no team will be permitted to work outside the territory to which it is assigned. In this way closer co-operation is expected and a more thorough canvass of the city made possible.

Strike on the Great Lakes Averted

WASHINGTON, March 19.—A general strike of the employees of all vessel owners included in the membership of the Lake Carriers' Association, which was threatened last October and deferred to give the United States Shipping Board an opportunity to investigate the complaints of the men, is believed to have been finally averted as the result of the board's decision which has just been announced and which is concurred in by the Department of Labor.

The Lake Carriers' Association is composed of 64 vessel owners or managers, operating over 400 vessels carrying iron ore, coal, etc., upon the Great Lakes. Its declared object, among other things, is "to establish and maintain by contract or otherwise such amicable relations between employers and employed as will avoid the public injury that would result from lockouts and strikes in the lake carrying service." The International Seamen's Union, however, has charged that the "welfare plan" of the Association was virtually a strikebreaking and blacklisting system and has repeatedly threatened a strike for the purpose of securing its abolition.

A strike for higher wages and for the abolition of the welfare plan—particularly the continuous discharge book feature—was ordered for Oct. 1, 1917. In view of this contemplated strike the United States Shipping Board made an investigation of the welfare plan and discharge book system. Conferences were held with the representatives of the lake seamen's unions and the Lake Carriers' Association, at which the Shipping Board was assured that the Lake Carriers' Association would abolish the discharge book and modify the welfare plan in any manner the board might direct after fair investigation. As a result of its investigation, the Shipping Board has decided that the discharge book is undesirable and should be abolished.

The War Trade Board of Canada has made arrangements with the War Trade Board of the United States whereby canners of Canada will be enabled to obtain supplies of tin plate from the United States at an approximate price of $7.75 per base box of 300 lb. An order-in-Council has been prepared by which the Canadian Government will take power to purchase on behalf of the canners the total supply of tin plate necessary.

HIGH PRICES DISCUSSED

Not Necessarily Unpatriotic, Says President Lemoine—U. S. Cast Iron Pipe Report

In the annual report of the United States Cast Iron Pipe & Foundry Co. for 1917, President Lemoine states that on account of war conditions the plants did not produce more than 35 to 40 per cent of their estimated capacity in the company's chief product, but stocks of pipe were materially reduced. Export shipments were considerably curtailed because of inability to secure bottoms in competition with the demands of the Government and its Allies for shipping. The income account is, however, fairly satisfactory and compares as follows:

	1917	1916	Changes
Net earnings	$1,820,744	$1,539,742	*$281,002
Other income	42,351	30,154	*12,198
Total income	$1,863,095	$1,569,896	*$293,199
Depreciation reserve	403,640	144,000	*259,640
Bond interest	48,540	60,720	†12,180
Bills payable	68,774	56,534	*12,240
Balance	$1,324,140	$1,308,641	*$33,499

*Increase. †Decrease.

President Lemoine discusses various subjects of public interest connected with the war. He says that high prices should not be considered as evidence of unpatriotic motives when higher prices than the maximum are a necessity in order to maintain or increase the productive capacity of a much needed commodity or article of commerce. The Government, he says, adopts this idea for the farmer with his wheat, guaranteeing him the minimum price for the avowed purpose of increasing the quantity, while with all others it adopts the opposite policy of fixing a maximum price. "In some directions," he adds, "it has already been demonstrated that maximum prices are a failure. The desired production did not materialize. The limit on prices produced embarrassing shortages. In the long run, it is dangerous to trifle with the law of supply and demand."

In regard to Government operation of railroads, Mr. Lemoine says:

"As the result of unwise interference the railroads had been so crippled as not to be able to meet the emergency of the moment. Their operation by the Government is sure to afford a larger insight into their needs, which could not well otherwise obtain, so that when they are returned to their owners it is reasonable to expect sympathetic treatment; and so all along the line as regards shipping, immigration, the tariff and other great questions we may reasonably expect more helpful constructive legislation. All must benefit from the growth of fairness and justice that will obtain from such economic business relations of the future. Broadly viewing the situation as it affects your interests, therefore, may we not hopefully regard the future, believing the Government can be relied upon to a greater extent than heretofore to conserve after the war the interests of the country's industries and consequently of the many owners thereof?"

Nova Scotia Steel & Coal Co. Report

The annual statement of the Nova Scotia Steel & Coal Co. is issued this year to cover the operations of the parent company and all its subsidiaries, thus a consolidated balance statement is issued to cover both the Nova Scotia Steel & Coal Co. and the Eastern Car Co. On this account comparisons with previous years cannot satisfactorily be made. The change has evidently been made at the suggestion of the auditors of the company, as the Nova Scotia Steel & Coal Co. has guaranteed the bonds of the subsidiary and owns all the common stock. An analysis of the general consolidated balance sheet indicates that the company is now in a strong financial position, the total current assets being over $10,000,000 in excess of current liabilities. The combined profits from operations, after providing for maintenance and renewal expenditures, but before deducting depreciation, interest charges, etc., for the year ending December last was $3,069,449.23, before deducting proportion of commissions, and discounts on securities written off, provision for depreciation, income tax, etc., which amounted to $976,113.20 leaving profits of $2,093,336.03. Deductions, including interest on bonds, leave net profits of $1,340,477.83, which, added to the surplus on January, 1917, of $3,532,-114.63, made an amount for distribution of $4,872,-592.46. Other deductions included dividends on the 8 per cent cumulative preference stock of the Nova Scotia Steel & Coal Co., $80,000; cash dividend declared on the ordinary stock of the Nova Scotia Steel & Coal Co., $562,500; stock dividends declared on the ordinary stock of the Nova Scotia Steel & Coal Co., $2,500,000, totaling $3,142,500, leaving the surplus carried forward $1,730,092.46.

Baldwin Locomotive Meeting

At the recent annual meeting of the Baldwin Locomotive Works, an unsuccessful attempt was made by John M. Luntz of Baltimore to have the salaries of all executive officers reduced one-half. His vote was the only one in favor of the cut.

The annual report showed that in 1917 the company's production of every kind amounted to $98,263,-864. Last year 2,748 locomotives were built, of a value of $63,455,574. Other regular work amounted to $13,-835,707, and contracts for shells and other special work aggregated $20,972,503. Net profits amounted to $8,305,722.

The report said: "The locomotive business at the beginning of 1918 continues favorable. The probability that the Government will be the chief purchaser presents a new condition the effects of which cannot be foreseen."

Dr. Thomas G. Ashton was elected a director, succeeding Guy E. Tripp, New York, resigned. Harold T. White, New York, was chosen to the board to succeed his business partner, Francis M. Weld, who has joined the service of the nation. Directors re-elected are President Johnson, Samuel M. Vauclain, vice-president; William L. Austin, Samuel McRoberts, Samuel F. Pryor, William E. Corey, Sydney E. Hutchinson, Sidney F. Tyler, James Wilson Bayard and B. Dawson Coleman.

LaBelle Iron Works' Best Year

The annual report of the LaBelle Iron Works, Steubenville, Ohio, for the year ended Dec. 31, 1917, showed very much the largest earnings in any one year in the history of the company. The surplus for the year was $6,396,927.75. The following is a statement of the income account:

Net earnings from operations after deducting charges for maintenance and repairs to plant of $1,605,405.54		$14,167,665.14
Add—Other income		30,738.97
Total income for the year		$14,198,404.11
Deduct—		
Provisions for exhaustion of minerals and extinguishment of lease values	$420,281.78	
Provision for general depreciation	750,000.00	
Provision for accidents and contingencies	90,907.76	
Interest on mortgage bonds	145,654.34	1,406,843.88
Net earnings for the year		$12,791,560.23
Deduct—Special charges—		
Provision for inventory reserve, adjustments, etc.	$1,200,000.00	
Net premium on bonds purchased	5,330.00	
Provision for excess profits, income taxes, etc.	5,189,302.48	6,394,632.48
Surplus for the year		$6,396,927.75
Deduct—Dividends—		
Preferred stock, 8 per cent	$793,232.00	
Common stock, 12 per cent	1,189,848.00	1,983,080.00
Balance		$4,413,847.75
Add—Surplus at Jan. 1, 1917	$5,656,763.82	
Less—Additional provision for extinguishment of lease values, etc.	550,000.00	5,106,763.82
Surplus carried to balance sheet		$9,520,611.57

The condensed balance sheet as of Dec. 31, 1917, is as follows:

Assets

Capital assets—		
Land, buildings, plant, machinery, equipment, etc., including payments in respect of construction contracts in progress		$28,611,047.79
Investments at or below cost		278,871.87
		$28,889,919.66
Cash deposited with trustee—		
For redemption of first mortgage gold bonds. (see contra)		1,050.00
United States Liberty Bonds held in behalf of employees	$374,900.00	
Less — Payments received from employees	181,483.00	193,417.00
Current assets—		
Inventories of manufactured products, materials and supplies at cost	$7,561,673.74	
Accounts and notes receivable	2,658,658.70	
Investments in—		
United States treasury certificates of indebtedness $500,000.00		
United States Liberty bonds 2,224,350.00	2,724,350.00	
Cash	4,414,001.79	17,358,684.23
Deferred charges to future operations		62,528.02
		$46,505,598.91

Liabilities

Capital liabilities—		
Capital stock—		
Common—Total authorized issue	$10,000,000.00	
Total issued — 99,154 shares of $100.00 par value		$9,915,400.00
Preferred—Total authorized issue	$10,000,000.00	
Total issued — 99,154 shares of $100.00 par value		$9,915,400.00
		$19,830,800.00
First and refunding mortgage sinking fund gold bonds (total authorized issue, $7,500,000.00)—		
Total issued	$3,500,000.00	
Less — redeemed and cancelled $800,000.00		
Bonds purchased and held in treasury 146,500.00	946,500.00	2,553,500.00
		$22,384,300.00
Current liabilities—		
Accounts payable	$885,362.48	
Wages, taxes and royalties accrued	434,690.14	
Bond interest accrued and coupons not presented for payment	27,424.59	
Accrued excess profits and income taxes	5,189,302.48	6,536,779.69
First mortgage 6 per cent gold bonds—		
Called for redemption—Cash held by trustees. (see contra)		1,050.00
Reserves—		
For general depreciation	$2,802,500.71	
For exhaustion of minerals	2,432,666.01	
For relining and rebuilding furnaces, etc.	312,069.27	
For accidents and contingencies	315,621.66	
For future fluctuations in prices, etc., of raw materials and supplies	2,200,000.00	8,062,857.65
Surplus—		
At Dec. 31, 1917, per annexed statement		9,520,611.57
		$46,505,598.91

The total production of ore in the mines of the company for the year 1917 was 364,940 gross tons, an increase over 1916 of 3.4 per cent. The company placed in operation on March 1, 1917, a Koppers by-product coke plant of 94 ovens, which produced in the remaining 10 months of the year 307,103 net tons of furnace coke; 4,254,194 gal. of tar; 5499 net tons of sulphate of ammonia; 669,320 gal. of benzol, and 170,023 gal. of toluol. The total output of coal in 1917, at its Steubenville, Wheeling and LaBelle mines was 309,688 net tons, an increase over 1916 of 144,399 tons. The output of pig iron, semi-finished steel and finished steel products, was as follows:

	1917	1916
Pig iron	260,182	257,623
Ingots	419,491	416,783
Billets and slabs	350,053	350,426
Finished goods	394,249	416,827

The average number of employees during the year was 4183, the pay roll for this period aggregating $5,905,201.20, or an average of $1,411.71 for each employee.

The aggregate value of shipments for the year was $31,656,268.02, compared with $19,698,155.08 for the previous year.

President R. C. Kirk, in his report to the stockholders, in commenting on the outlook for 1918, said:

"During the year your company acquired 3581 acres of steam coal in Brooke and Ohio counties, West Virginia, including 412 acres of surface, this acreage being in a solid block.

"Your company, through its subsidiary, LaBelle Coke Co., also acquired during the year 3045 acres of coking coal, including 295 acres of surface, situated in Allegheny county, Pennsylvania, fronting on the Allegheny river.

"Events of the past several months have made plain to all of us that the uncertainties of trade are much greater than in normal times. Government regulation of prices of your products, with similar regulation lacking in respect to many items entering into cost of production, has an intimate bearing on earnings. It is obvious that your company's earnings for 1918 will be materially less than in the year just closed."

Studebaker Earnings Decline

The report of the Studebaker Corporation and its subsidiary companies for the calendar year 1917 shows total sales of $50,147,516, against $61,988,594 for 1916—a decrease of $11,841,078 in the year—while net profits declined from $8,611,245 to $3,500,741, a loss of $5,110,504, or close to 60 per cent, in a single year. The net earnings for 1917 represent 9.11 per cent on the common stock as compared with 26.1 per cent. for 1916. In August, 1917, the directors cut the dividend on the Studebaker stock from 10 to 4 per cent.

The heavy loss both in gross business and profits, says President Erskine in his report, "occurred in the automobile division of the business, after our country entered the war, and largely because of the disturbed conditions that afterward existed. In the first quarter we sold 16,083 cars, against 15,580 in the same period of the preceding year, but in the remaining nine months we sold only 26,274 cars, against 50,305 cars in the same period of 1916. Our net profits suffered greater shrinkage proportionately than sales, because of the curtailment in production we were required to make in May and increases in costs of raw materials, wages and selling expenses."

Yale & Towne Report

The Yale & Towne Mfg. Co. reports for year ended Dec. 31, 1917:

	1917	1916	Inc.	Dec.
Total net earnings	$2,867,510	$3,386,426	.....	$518,916
Depreciation	323,669	662,579	.....	338,910
Federal taxes	553,850	.....	$553,850	.....
*Net profits	1,989,991	2,723,847	.....	733,856
Dividends	989,614	1,513,539	.....	523,925
Surplus	1,000,377	1,210,308	.....	209,931
Profit and loss surplus	8,259,509	7,259,132	1,000,377	.....

*Equal to $40.21 a share on $4,948,070 capital stock as compared with $57.86 a share on $4,731,400 capital stock in 1916.

Sloss-Sheffield Meeting

At the annual meeting of stockholders of the Sloss-Sheffield Steel & Iron Co., held in New York last week, Landers Sevier, general agent of the Southern Railway, Birmingham, was elected vice-president. Waddell Catchings, who recently resigned as president and was succeeded by James W. McQueen, was elected chairman of the board to succeed J. C. Maben. The company's operating profits for the 13 months to December, 1917, were $3,370,614. After bond interest, depreciation and other charges and a deduction of $325,000 for Federal taxes, a balance of $2,152,273 was left for stock. President McQueen expressed the opinion that with demand of pig iron exceeding the supply, the outlook for the company in 1918 was favorable, notwithstanding some uncertainties.

Steel Foundry Operations in the Chester, Pa., District

The steel casting industry of Chester, Pa., and vicinity, is the largest one in the United States producing acid open-hearth castings. There are other centers where a larger output of basic castings is made. The Chester field is now extremely busy producing war castings of all kinds, and the war has completely changed operating and other conditions of the one converter and seven open-hearth plants. All the open-hearth operations are acid except one. The output of all the eight foundries referred to is at least 10,000 tons per month of finished castings.

While all plants are filled with orders the great drawback to capacity output is the labor problem. It is freely admitted that this is serious and that as compared with normal times labor cost has increased 80 to 85 per cent. The steel casting plants are located near the great Delaware River shipyards, where wages have advanced to rates like 38c. for heaters and $1.35 per hr. for forgers, and where the number of plants has more than doubled since the war started. Some steel foundry molders are making easily $7 to $8 per day. Boys of 15 or 16 in the shipbuilding plants are making as high as $35 per week, it is stated. The labor problem is the most serious one at Chester, especially in view of the fact that castings are almost as important as ships. Nearly every plant has all kinds of ship and ordnance castings on the books.

War conditions have upset specifications. It has been found almost impossible to make acid steel which will meet the standing requirements of 0.05 per cent sulphur as a maximum. This is due to a higher sulphur content in the pig iron and scrap available, as well as to poorer fuel. While specifications have not been officially changed, steel is being accepted with as much as 0.06 per cent sulphur and in some cases higher. This applies to railroad material as well as to Government work.

The demand for nickel steel castings has increased very much. All gun yokes, gun-mount stands, carriages, slides, deck lugs, etc., of large size are being made of this steel. The specifications demand a tensile strength of 85,000 lb. per sq. in., an elastic limit of 53,000 lb. per sq. in., an elongation in 2 in. of 22 per cent and a reduction of area of 35 per cent. Nickel steel is not demanded but any alloy steel is permitted so long as these requirements are met. So great is the demand for these castings that some foundries are having trouble meeting the specifications. As a result the Government has under consideration the creation of a new grade of castings of carbon steel, calling for a tensile strength of 80,000 lb. per sq. in., an elastic limit of 44,000 lb. per sq. in., an elongation in 2 in. of 22 per cent and a reduction of area of 30 per cent. Views on this suggestion have been asked for from the foundries.

The Eagan-Rogers Steel & Iron Co., Crum Lynne, Pa., is now making 80 per cent of the small castings required by the Government and is devoting practically all its output to Government work. The company's large new office building has been completed and other important improvements have been made in the plant. A feature of this company's converter steel process is the use of the Stoughton oil-burning cupola. The company has been the pioneer in the experimentation and development of this device, and it is now stated that it is operating continuously and successfully. Only one-seventh of the coke is consumed that is usually used in a cupola, but the sulphur content of the steel is reported as considerably below that obtained when coke alone is the fuel.

The Penn works of the Penn Seaboard Steel Corporation has nearly completed the extension to its foundry space and is very busy on Government, railroad, ship and shell castings. The excess capacity of its open-hearth department is easily absorbed by the cast-steel 9.2-in. shell ingots it is making.

The Federal Steel Foundry, owned by the William Cramp Ship & Engine Building Co., is working at capacity on ship and Government castings and is making stern posts for shipyards as far south as Florida. A drying oven of concrete is a departure, the results from which are awaited with interest.

The American Locomotive Co.'s plant at Chester, formerly the Seaboard plant of the Penn Seaboard Steel Corporation, is full of orders for locomotive and other castings, as is also the Chester Steel Casting Co. The former plant has increased its open-hearth capacity.

The Thurlow plant of the American Steel Foundries is producing one heat per week of nickel steel for ordnance work and is operating to capacity on other Government, ship and locomotive work.

The Baldt plant of the Penn Seaboard Steel Corporation at New Castle, Del., is fast being converted from a steel foundry into a plate mill where plates up to 84 in. will be rolled. It is expected that this will be in operation by June 1. Besides the six open-hearth furnaces at this plant for making ingots, the four open-hearth furnaces of the company's plant at New Haven, Conn., will cast slabs for conversion into plates at New Castle.

An interesting possibility confronting the entire steel casting industry of the Chester district as well as of the country is the Government proposition that steel foundries, both converter and acid open-hearth, use copper-bearing low phosphorus pig iron so as to release all other low phosphorus iron to gun-making plants. This will be no hardship to converter foundries, several of which are now using copper iron with beneficial results, both statically and otherwise.

The average price now being obtained for castings in the Chester district is 7.50c. to 9c. per lb. This compares with as low as 2c. to 2.50c. back in the lean days of 1904 and with not much above this level before the war. It is understood that Government work under specifications is not affected by any fixed schedule of prices, the recently published schedule not being applicable to this class of work.

The expansion of the anchor industry has been striking. The Baldt Anchor Co. now has a plant of its own, where the various parts, as made principally by the Penn works, are assembled, tested and shipped. The plan of the Bowen Anchor Co., a new establishment, to build an open-hearth plant at Morton, Pa., near Chester, to make its own anchors of special design has not been completely carried out. It is stated that the company has orders for $2,000,000 worth of anchors.

Increased Activity of Furnaces in Youngstown District

More blast furnaces in the Youngstown, Ohio, district are in operation at present than for some months. There are 26 stacks in that district, and only four are now idle, these being Niles stack of the Carnegie Steel Co., at Niles, Ohio; No. 1 Haselton of the Republic Iron & Steel Co., one of the East Youngstown stacks of the Youngstown Sheet & Tube Co., and Hall furnace of Republic Iron & Steel Co., at Sharon, Pa. Shipments of coke reaching the Mahoning and Shenango valleys are larger than for some months, and much of the former trouble in getting coke has been relieved. As yet none of the blast furnaces is being driven to full capacity, partly on account of the poor quality of coke, and because the supply of coke is not yet large enough to allow furnaces to be driven to full capacity. It is probable that Niles furnace of the Carnegie Steel Co., at Niles, Ohio, may be started before long, as a supply of coke seems to be fairly well assured. Neville Island furnace at Pittsburgh may also start in the near future.

To facilitate the making of all calculations where quantities are expressed in pounds and prices in dollars per gross ton are involved, the Velick Scrap Iron & Machinery Co., Inc., Detroit, has brought out a table, so that by multiplying the number of pounds by a decimal equivalent results are obtainable for prices ranging from $10 to $50 per gross ton.

BILLION FOR THE NAVY

Immense Appropriation Proposed to Continue New Construction Program

WASHINGTON, March 19.—The resumption of the construction of the three-year naval program of battleships, scout cruisers and auxiliaries is directed by the terms of the annual naval appropriation bill just reported to the House carrying the stupendous sum of $1,325,000,000. Although Congress at the last session appropriated in the aggregate more money for the naval establishment the funds were carried in four separate bills, totaling $1,625,000,000. There is no doubt that before the end of the present session additional allotments of money for naval purposes will be made that will exceed last year's appropriations. It is significant that although the belief was general in Congress that the peak of expenditures for the navy during the present war was reached last year, the total to be disbursed during the coming fiscal year, beginning July 1, next, will break all records.

The Original Plan Changed

The original three-year building program called for the construction during the current fiscal year of one battleship, three battle cruisers, three scout cruisers, nine fleet submarines, one ammunition ship, one transport, one destroyer tender and one hospital ship. The submarine menace, however, upset the calculations of the Bureau of Construction, for it was apparent that battleships requiring three or four years to build could not be counted upon to aid in the campaign against the undersea boats. At first the department planned to meet the submarine with an enormous fleet of small U-boat chasers and a large number of contracts for these craft were placed. Subsequently, however, the naval experts reached the conclusion that the chaser was too small and could not be satisfactorily operated at any great distance from the shore, while the torpedo boat destroyer showed exceedingly desirable qualities for this difficult and dangerous work. In view of the limited capacity of private shipyards capable of building large and fast destroyers, Secretary Daniels decided to suspend work on battleships, battle cruisers, and scout cruisers, and to concentrate all available facilities upon the building of 160 destroyers. To lay down this number required a larger equipment than was possessed by existing yards and the department therefore agreed to finance very substantial extensions to insure rapid destroyer construction.

Building Destroyers

The work of building destroyers has progressed rapidly, and in addition to the large boats originally designed contracts have been let for a big fleet of specially designed vessels nearly twice the length of the 110-ft. submarine chasers. A large number of the new boats, which will be classed as small destroyers, are to be built at the Ford plant in Detroit, and sent to tidewater through the Welland Canal. The department has made no announcement with regard to the number of submarine chasers and small destroyers to be built, but as it will be necessary to meet the cost of a large number of these vessels in the immediate future, the naval bill, as reported, gives the President discretionary powers to build as many as may be desired to be paid for from a lump sum, as follows:

To enable the President to secure the more economical and expeditious delivery of materials, equipment and munitions and secure the more expeditious construction of ships authorized, and for the purchase or construction of such additional torpedo boat destroyers, submarine chasers and such other naval small craft and for each and every purpose connected therewith as the President may direct, to be expended at the direction and in the discretion of the President, $100,000,000.

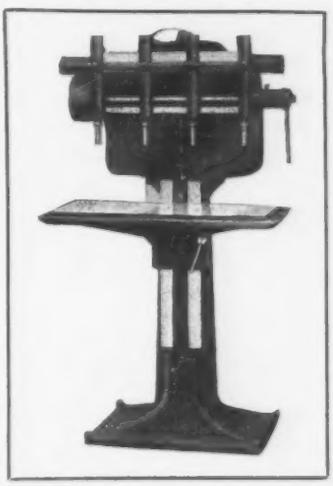
Extending Navy Yards

Pursuant to the policy of the Navy Department to expand existing navy yards and naval stations and to equip a considerable number of yards for the construction of capital ships, torpedo boat destroyers, submarines and auxiliaries, the bill carries $12,000,000 for the Bureau of Yards and Docks. At Philadelphia $2,400,000 will be spent; at Brooklyn, $850,000; at Norfolk, $3,900,000; at Mare Island, $1,200,000; at the Hampton Roads naval base, $2,500,000, and at the San Diego marine corps base, $1,500,000. The money to be spent at Hampton Roads and San Diego will be devoted to developing the war project devised a year ago contemplating the creation of a large well-equipped naval base on the Atlantic and on the Pacific with repair facilities, warehouses for naval material, quarters for personnel, etc.

As the aircraft program of the Navy is to be carried forward independently of the work of the Aviation Board of the War Department, the bill, as reported, carries $188,000,000 for this purpose, which will cover the construction of as many naval planes as can be built during the coming year, together with their accessories and the necessary training grounds and housing. Other important items in the bill are ordnance stores, $24,194,045; new batteries for battleships, $48,309,523; ammunition for vessels, $39,000,000; powder and other ordnance supplies, $50,000,000; for manufacture of smokeless powder, $2,400,000; increasing facilities for testing guns, $1,000,000; reserve ordnance and supplies, $33,000,000; torpedoes, $1,000,000; instruments and supplies for navigation, $3,469,000; purchases of material by the Bureau of Supplies and Accounts, $213,229,557; disbursements of Bureau of Steam Engineering, $50,000,000; general maintenance, $12,000,000.

Multi-Spindle Valve Grinding Machine

A line of machines for grinding the valves in the cylinders of internal combustion engines has been developed by the Defiance Machine Works, Defiance, Ohio. Three different sizes are built with four, six and eight spindles respectively. These spindles, which have an adjustment to take care of varying distances between the valves and are located 7 in. from the face of the column, are provided with an oscillating movement that is obtained through a set of spur gears. This, it is pointed out, eliminates practically all vibration in the machine. All of the working parts are inclosed to guard against the entrance of dust and protect the operator from injury. The spindles have a vertical travel of 3 in., the minimum and maximum distances between the nose of the spindle and the top of the table being 9¾ and 21¾ in. respectively.



In a New Machine for Grinding the Valves of Multi-cylinder Internal Combustion Engines Spur Gears Are Employed to Provide the Oscillating Movement and Eliminate Vibration

The *Oil Trade Journal*, 120 Broadway, New York, has published a directory of the petroleum and natural gas industries, which will be found of considerable value as a reference by companies making equipment and supplies suitable for the concerns engaged in those lines. Lists of producers of petroleum, with the locations of oil properties, names of officers of the companies, capital stock and other valuable information, are given in one section of the book: Marketers and jobbers of petroleum products, names of manufacturers of equipment and much other interesting data are published. Full information regarding the many associations in these industries is also presented.

Standardizing Manufacturing Methods

A Proposal Covering Methods of Handling, Tool Equipment and Gaging Systems in Making Articles for the Government

BY ALBERT A. DOWD*

OUR entire nation is vitally interested at the present time in producing the "sinews of war" by means of which every American citizen hopes to see such havoc wrought against the Hun as to bring this terrible war to a speedy close. Our government is doing wonderful work in the mobilization of an immense army of fighting men; the problems connected with the financing of the war are being solved in a manner worthy of commendation; munitions are being turned out by factories all over the country at a tremendous rate and in a most practical way; but—military rifles, rapid fire and anti-aircraft guns, gun mounts, aeroplanes, motors and gun sights, to say nothing of submarine work, etc., are by no means produced in an efficient manner. Nearly every factory of any importance and many small shops all over the country are engaged on Government work of some kind connected with the war.

True, the work is being produced more or less rapidly according to the factory and its equipment, but there is a lack of co-ordination in production and problems connected with the machining and gaging of the products have not received their proper attention in many cases. It has been the writer's privilege to examine a number of jigs, fixtures and various equipments designed and built by factories more or less unfamiliar with the product which they are about to manufacture and it is with the greatest regret that he feels obliged to comment on the crudity and lack of mechanical skill evident in much of this work. Jigs and fixtures are often poorly designed and unmechanical in principle. The methods of handling, sequence of operations, gaging and other problems connected with manufacture are widely different in various factories producing the same sort of work.

What is there to prevent us from standardizing methods of handling, tool equipment and gaging systems for all the products required by the Government in war time, so that under the pressure of necessity it will only require that to any private manufacturer who has received a Government contract the Government can send blueprints of the parts to be made, operation sheets showing the sequence of operations, blueprints of tool equipment, blueprints of gages and time studies for each operation on each piece to be manufactured.

Our Government standardizes military equipment of all kinds, and the writer fails to see any good reason why the equipment for manufacturing should not also be standardized as well as the methods of manufacture. Let us take as an example the extractor collar for a military rifle. This is only one of a great number of components in a Spanish Mauser rifle and is a simple piece compared to many of the other parts in the rifle. It is selected simply because the number of operations on it are few and it will illustrate the point as well as one of the larger pieces.

Let us assume that a manufacturer has received a Government contract to produce 50,000 of these rifles. His first step in the matter is to turn over the blueprints and models to his planning and equipment engineers, who go through all of the components, plan the operations, design the tool equipment and gages. As fast as the operation sheets are worked out the drop forge dies for parts requiring drop forging are immediately started, tool design is commenced and machines and routing of various pieces is decided upon and everything is hustle and bustle for weeks, until at length drop forgings commence to be received and some of the equipment, tools, jigs and fixtures are completed. At last, after weeks or months of unremitting labor, the product begins to be materialized ready for assembling.

If all gages have been properly made and work has been kept within the specified limits, the assembling goes along without difficulty until finally the completed rifle is received by the Government after a delay of a number of months, a large part of which could have been avoided by preliminary planning. In this event the manufacturer receiving the contract would receive at the same time a complete set of operation sheets similar to that shown, so that this part of the preliminary work

SERVICE ENGINEERING CO.

TOOL AND OPERATION SHEET

CUSTOMER

ADDRESS

NOTE

THIS OPERATION SHEET NOT TO BE CHANGED WITHOUT WRITTEN CONSENT FROM TOOL ENGINEER

PIECE NO. 32

NAME Extractor Collar

NO. OF PIECES PER UNIT 1

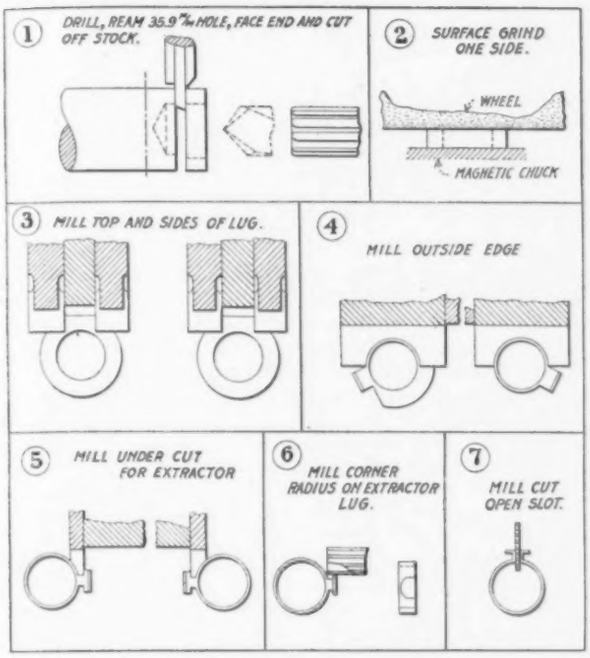
MATERIAL Steel (Vanadium Type D) 1¼ dia.

ALLOY Sq Carbon

PRODUCTION | EQUIPMENT | REMARKS

The Various Operations Entering into the Production of the Part Shown at the Upper Left and the Equipment Required Are Listed on a Tool and Operation Sheet

*Consulting engineer, New York.


1 DRILL, REAM 35.9 HOLE, FACE END AND CUT OFF STOCK.
2 SURFACE GRIND ONE SIDE.
WHEEL
MAGNETIC CHUCK
3 MILL TOP AND SIDES OF LUG.
4 MILL OUTSIDE EDGE
5 MILL UNDER CUT FOR EXTRACTOR
6 MILL CORNER RADIUS ON EXTRACTOR LUG.
7 MILL CUT OPEN SLOT.

Sketch Showing the Different Operations Listed on the Tool and Operation Sheet and the Appearance of the Part after Each

would be saved. It will be noted that the operation sheets give a complete record of all the operations needed, all the tools, fixtures and gages necessary, and in addition gives production figures on which the manufacturer can base his estimates as to the number of machines of each kind he will require. Now it will be admitted by any mechanical man that this is a tremendous saving in time and labor. Carrying the matter a step further, if the manufacturer were at the same time to receive complete blueprints of jigs, tools and fixtures, together with layout showing the methods of handling each part in each operation, he would already have saved several months' time and could commence building drop forge dies, tools and equipment immediately after the receipt of the Government order. There would be no experiments, no useless delay, less expense and much more rapid production.

The engineers called upon for this work must be experienced both in theory and particularly in practice; they must know machine tools from the practical end and must be familiar with the most improved methods of manufacture and must be able to apply these methods to advantage. Under these conditions the operation sheets, layouts, jigs, fixtures and gages would be the proof of long experience in this line of work and would result in enormous savings for the Government on all of their products. There is also another point to be taken into consideration and that is with a carefully worked out system of this kind and a time study to show the estimated machining time on various operations, comparisons and estimates should be made on the cost of production which would be very valuable. For this reason time studies should be conservative rather than up to the limit of machine capacity.

The diagram layout of operations indicated in the accompanying drawing represents the work as it appears in each successive stage of machining, shows the action and sequence of the cutting tools used and gives an idea of the method and the tools employed. It will be noted that enough detail is shown in the layout to make it very apparent just how each operation is handled and the conditions of the work at each stage. The value of data of this kind to any manufacturer about to engage in work for the Government cannot be overestimated and it is to be hoped that our engineers in Washington will realize the value of preliminary planning and lose no time in standardizing such work and thus obtain maximum results in the matter of production.

It is by no means a small job to undertake a proposition of this kind, but we have experienced engineers in this country to carry out such a project without difficulty when once the question has been decided. A great deal of red tape would be eliminated and matters connected with the manufacture of difficult work would be much simplified, so that the final results would be gratifying in the highest degree.

The writer recently completed the equipment work on an automobile factory for a foreign government and has used the system advocated here throughout the entire work; planning operations, time studies, layouts, jigs and fixtures, gages, etc., so that when finished the work is complete to the smallest detail. To the discriminating judgment of the engineers throughout this country there can be no doubt of the value of the system and it only remains for our Government to take the matter up and carry it to a successful conclusion.

Will Organize Steel and Iron Section of Canadian Institute

At the twelfth annual meeting of the Canadian Mining Institute, held in Montreal, Col. David Carnegie, of the Imperial Munitions Board, Ottawa, in a paper on "Some Problems in the Reconstruction of Industries," emphasized two points in connection with after-the-war trade: How to secure remunerative trade without unfair competition, and how to maintain efficient production with competitive co-operation. He suggested the organization of two distinct bodies from each industry, one to secure trade, and the other to encourage production of materials, both working under Government sanction, the trade boards to be elected by the manufacturers and buyers from concerns interested, and the production boards elected by the manufacturers and their employees. He went on to say that before the war Canada's capacity to produce steel was approximately 1,000,000 tons per year, or about one-eightieth of the world's steel producing capacity. Today it is approximately 2,250,000 tons, or about one-fortieth of the world's capacity.

The metal interests held a separate meeting in Montreal, and decided to organize a steel and iron section of the Canadian Mining Institute. Some of the metal men favored forming an independent Steel & Iron Association, and it was agreed that if this should be deemed necessary it could be done later. An organization committee was named as follows: Robert Hobson, Hamilton, Ont.; Col. Thomas Cantley, Mark Workman, W. C. Franz, Dr. Alfred Stansfield, W. J. Jannsen, H. M. Jacquays, J. A. Irwin, C. F. Bristol, Esmond Peck, G. H. Duggan and P. L. Miller, of Montreal; J. J. Hartley, Kingston, Ont.; F. H. MacDougall, Sydney, N. S.; F. H. Crockard, New Glasgow, N. S.; George W. Watts and William Inglis, Toronto, Ont.; J. G. Morrow, F. A. Sherman and W. M. Curry, Hamilton, Ont.; Col. David Carnegie, Ottawa, Ont.; Capt. David Hyle, Sault Ste. Marie, Ont.; M. Deakins, Winnipeg, Man.; Fleet Robertson, Vancouver, B. C., and George McKenzie. This committee will start in on the work of organization at once.

Raymond E. Brown, contracting engineer, has opened an office at 90 West Street, New York, for Heyl & Patterson, Inc., Pittsburgh, builder of special cranes. The company at first intended to open an office at 30 Church Street, but the West Street building was finally decided upon.

Protection in the New Revenue Bill

Proposed Tariff to Increase Production of Manganese, Tungsten and Other Ores—Higher Taxes on Individual and Corporation Earnings

WASHINGTON, March 19.—Notice has been given by Chairman Kitchin of the House Ways and Means Committee that early next month a program for securing additional funds to carry on the war will be brought forward. The initial step will be the presentation of a bill authorizing a large issue of Liberty bonds, presumably bearing 4½ per cent interest, and will be followed later by a measure more comprehensive than any revenue project considered since the beginning of the war in Europe. In framing it the Ways and Means Committee will consider the consolidation of the income tax laws of 1916 and 1917, probably with increases in both individual and corporate taxes; the complete redrafting of the excess profits tax, doubtless with a substantial increase in rates, and a plan now being urged by influences not heretofore active in this direction, contemplating considerable increases in the rates of the dutiable schedules of the Underwood-Simmons tariff act and the imposition of duties upon many of the most important items of the present free list. The proposition for tariff changes has recently assumed a serious aspect as the result of agitation for the development of domestic deposits of manganese, tungsten and other ores which, it is contended, can only be undertaken on a basis that will guarantee reasonable protection after the war is over.

New Bonds at 4½ Per Cent

The bill authorizing a bond issue, of which Mr. Kitchin gave notice on the floor of the House during the past week, will empower the Secretary of the Treasury to sell sufficient bonds to take up outstanding certificates of indebtedness, and in addition to supply several billion dollars for war expenditures. This issue will include bonds heretofore authorized but not yet sold. While the rate of interest will be left to the Secretary of the Treasury it is understood that it will be fixed by him at 4½ per cent, that figure being necessary to maintain the bonds approximately at par. The bonds heretofore sold at 4 per cent and those sold at 3½ per cent and converted into 4's, now selling at a discount ranging from 2½ to 3½ per cent, will be automatically advanced to a 4½ per cent interest rate, unless the Treasury Department should resort to the device of limiting the new bonds to a life of not to exceed five years, which would be regarded as an evasion of the guaranty carried by the original bonds and is not at all likely to be done.

Consolidating 1916 and 1917 Tax Laws

The importance of consolidating the corporate and individual income tax laws of 1916 and 1917, especially if the rates are to be raised, is conceded. Under the existing arrangement taxpayers are compelled to figure their returns under two separate and distinct laws and at two separate sets of rates, the result being much confusion and doubtless countless errors. The difficulties encountered in the effort to administer simultaneously these two tax laws have proven exceedingly costly, and the Treasury Department will make a strong recommendation to the Ways and Means Committee to substitute a single carefully drafted statute for the two laws now in force. In this way normal tax rates and surtaxes will be included in a single table and such adjustments in rates as Congress may deem it necessary to make hereafter can be accomplished without amending the general terms of the law or the procedure thereunder.

The necessity for rewriting the excess profits tax law in toto becomes more apparent as the Internal Revenue Bureau continues to receive returns made thereunder. The situation can best be judged from the statement that it is the opinion of revenue experts that the law is so ambiguous and so uncertain in its provisions that it will be impracticable to bring a single prosecution thereunder for false or fraudulent returns, provided the taxpayers make even a perfunctory attempt to report their incomes. Such prosecutions being criminal would be tried before juries, and it would be an extraordinary situation indeed in which counsel for the defense could not convince a jury that any irregularities in a given return were due to a misunderstanding of the statute and not to an intentionally false statement.

The absolute impracticability of the excess profits tax has been fully demonstrated by the experience of the Board of Excess Profits Tax Advisers, and there will be no opposition to the abandonment of the present law. Sentiment has been growing of late in favor of the adoption of the English system simplified as much as possible and modified to meet the peculiar conditions existing in certain industries. It is probable that the rates of this tax will be raised, though the increases will not affect concerns enjoying but normal revenues. An effort will also be made to repeal the excess profits tax of 8 per cent now levied on the incomes of professions and occupations in excess of $6,000. This tax is regarded as a penalty on industry, as there is no corresponding tax on incomes derived exclusively from investments.

Protective Tariff for Alloying Minerals

The new developments in the movement for tariff revision deserve the careful attention of all producers and manufacturers. The effort made in connection with the act of 1917 to provide a horizontal increase in tariff rates and to impose duties on articles on the free list will be renewed and will of course encounter the same opposition which defeated it before. At this time, however, a new and very influential factor will complicate the situation. While certain producers of tungsten ores endeavored to secure the imposition of a duty thereon when the act of 1917 was pending, they stood alone in this movement and made but little progress. Now, however, other interests have been brought forward as the result of propaganda being urged by Secretary of the Interior Lane, who has asked Congress for an appropriation under which a large force of metallurgists can be set at work immediately on the necessary changes in practice to utilize low-grade manganese, tungsten and other ores with a view to reducing the importation of these minerals by developing deposits thereof in the United States.

"American mines," says Mr. Lane, "can produce all of these minerals provided they are given the necessary assistance of the Federal Government. Field parties of engineers and geologists must take samples for quick concentration tests to improve the quality of the domestic materials. Many new mines must be developed at once, and if these mines are to survive after-war conditions and become permanent industries they must be able to operate efficiently and take advantage of the most improved methods. With this object in view technical investigations suggested will inform the new operators of the best practice in their operations and will undertake to secure a technical solution of the difficulties which will make their products as desirable as that which was formerly imported. The development of new deposits, of better methods, and of substitute materials gives assurance that a large part of this new development may be permanent and thus make us less dependent on foreign supplies for essential minerals."

Owners of deposits of the minerals referred to are

taking up Secretary Lane's suggestion with their Senators and Congressmen, but are not limiting their representations to the necessity for the discovery of new processes for treating lean ores; in fact, they appear to be of the opinion that the lean ore problem will work itself out provided producers can have guaranties that the domestic products will be protected against the competition of the foreign article when the war is over. The point is made with much emphasis that owners of these deposits cannot be expected to develop them on a basis of pure patriotism with a moral certainty that as soon as the Government ceases to be the great buyer of steel it is to-day high-grade foreign ores, with the aid of ample shipping facilities, will immediately take over the American market.

The majority leaders in Congress are opposed on principle to any duty on raw materials for protective purposes, but the minority could be brought to favor such duties as are proposed, and in view of the fact that neither Democrats nor Republicans at present control the House and that the Democrats of the Senate include several pronounced protectionists, there is much interesting speculation as to the outcome of this movement. While it might be expected that a proposition to impose duties on manganese and tungsten would encounter strong opposition among steel makers, it must be remembered that an exact analogy is to be found in the stubborn contest which the textile manufacturers made against duties on coal tar dyes until the supply was cut off by the war, when Congress promptly gave the American dye producers a measure of protection which, while inadequate, substantially improves their position and will probably be supplemented by higher and more scientifically adjusted rates when the competition of foreign producers again becomes active. W. L. C.

Signal Corps Needs Many Electrical Men

The Signal Corps, U. S. Army, has announced that it can use the services of a large number of men having electrical training. They are needed especially in connection with the radio communication systems in use in the military service. All classes of electrical men—wiremen, expert electricians, storage battery men, telegraph and wireless operators, and men with electrical engineering training and experience are wanted. The opportunity offered is exceptional because of the great interest and importance of this branch of the service which has been most aptly characterized as the nerve system of the army. Men engaged in the radio division of the communication work in particular have an increasingly important part in the great intelligence system upon which army operations are almost totally dependent. The scope of this work requires men who will fall in general into three classes, depending on the character and amount of experience had by the individual; namely, radio operators, radio mechanics and field radio experts.

Application blanks for service in the radio work of the Signal Corps may be secured by addressing the office of the Chief Signal Officer, Land Division, Training Section, Washington. Men of draft age may make application and, if qualified, will be inducted into the army, at their request, for service in this branch of the Signal Corps. After enlistment or induction, all will be sent to one of several radio schools for six weeks to three months of intensive training in the one of the three general branches of the radio work for which their previous experience qualifies them. Some of the men completing these courses will be commissioned, and the opportunity for advancement for all graduates will be dependent on individual ability.

The Permutit Co., manufacturer of water softening and rectification apparatus, is now located at 440 Fourth Avenue, New York, the offices having been moved there on March 15.

The exporting of scrap iron has been prohibited entirely by the Canadian Government.

DAYLIGHT SAVING APPROVED

All Clocks Will Be Turned Ahead One Hour Easter Sunday Morning

WASHINGTON, March 19.—The United States will join the ranks of the daylight conserving nations of the world by virtue of the passage of the Calder bill, which, after having been approved by the Senate, was adopted by the House on March 15 by the overwhelming vote of 252 to 40. Minor amendments made by the House were promptly accepted by the Senate, and, as the President has always been an ardent champion of daylight saving, the bill will probably be placed on the statute books before the end of the present week.

The measure, as it becomes a law, provides that all clocks shall be turned ahead one hour at 2 a.m. on Sunday, March 31, and shall be retarded one hour at the same time on Sunday, Oct. 27, 1918. In subsequent years the change will be made at 2 a.m. on the last Sundays in March and in October. The bill also provides for the adoption by statute of the five time zones now observed, which are officially designated Eastern, Central, Mountain, Pacific and Alaska time.

The debate on the Calder bill in the House fully developed the great advantages, industrial and otherwise, that the bill is counted upon to bring about in view of the experience of the countries that have already made the experiment. Economy in heat, light and power, while perhaps the leading consideration in favor of the daylight saving plan, is regarded by Congress as hardly more important than the general improvement in the health of the workers that has invariably followed the adoption of this scheme in foreign countries. In the present emergency, also, the opportunity to cultivate war gardens, afforded by closing down manufacturing and commercial establishments one hour earlier in the afternoon, is regarded as a factor of very great importance.

According to information gathered by the House Committee on Interstate and Foreign Commerce, which reported the bill, England, France, Austria-Hungary, Italy, Sweden, Denmark, Norway, Australia, Iceland and Bermuda have all adopted the plan embodied in the measure with most gratifying results. According to official communications from the British and French Governments the experiment has not only proved a success in time of war but has developed such advantages that it will be continued in time of peace. In England alone in the short period of five and a half months the fuel saving amounted to more than $12,000,000, while in France this economy is figured at $10,000,000.

The popularity of the daylight saving idea in the big industrial communities of the United States was testified to during the debate on the bill in the House by prominent Representatives from Pennsylvania, New York and other important manufacturing states. "All the great industries of the State of Pennsylvania," said Representative Moore, "favor this legislation and there is a reason for it. If work is begun in the mills one hour ahead of the present time of beginning and ceases one hour ahead of the present quitting time there will be an hour's saving of artificial light and heat and a greater use of daylight for recreation and for profitable outdoor employment designed to increase the food supply. In England there has been much less use of the public house dispensing intoxicating liquors than before and, of course, this is a great gain in any industrial community. Another important consideration is the saving of strain on the eyes which has been especially noticeable in manufacturing concerns abroad where the finer processes of production are carried on. The trade and commercial bodies of Pennsylvania have sent large numbers of resolutions to Congress urging the passage of this bill as a war measure—a speeding-up measure—and individual business men in large numbers have appealed to us to hasten the enactment of this legislation."

TRACTOR INDUSTRY GROWING

Possibly 100,000 May Be Made This Year Involving Nearly 200,000 Tons of Iron and Steel

The manufacture of tractors, for both industrial and agricultural uses, has increased greatly since the war and according to manufacture it is likely to become one of the leading American industries in the consumption of iron and steel and may, at its present rate of progress, rank in a few years with the automobile industry.

It is generally estimated that the production of tractors in the United States during 1918 will reach 100,000. Some manufacturers, however, place their estimate as low as 50,000. Taking 75,000 as an average, and estimating about two and a half tons of iron and steel to each tractor, the industry will consume this year about 187,500 tons. Alloy steel is now being used in small quantities—one manufacturer reporting that he uses about 40 in. of 1-in. round chrome nickel steel in each tractor—but there will undoubtedly be an increase in this consumption inasmuch as manufacturers are striving for machines having maximum strength with minimum weight.

A manufacturer gives the following analysis of the make up of a tractor which has a total weight of 4944 lb.:

	Lb.
Gray iron	1,561
Rear hubs	140
Front hubs	56
Lugs	342
Channels	378
Tees	94
Plates	429
Cold rolled	270
Sheet steel	30
Steel castings	602
Malleable castings	102
Brass castings	49

Although the manufacture of tractors was begun in this country more than 16 years ago, the progress of the industry was relatively slow until the great need of food for the war became of such prime importance that governments began taking increased interest in their use for increasing farm production. There is a variety of opinion among manufacturers as to the proportion of our output which will be exported to foreign countries for agricultural purposes, but this is estimated at 20 per cent, more or less. England, France, Italy and Greece have bought tractors here for increasing their food production and undoubtedly there would be a heavy demand from abroad if the shipping situation permitted their free exportation.

The Government census showed 32,000 tractors on farms in the United States in February, 1917. Production in 1917 may have reached 50,000, though a few manufacturers believe it to have been lower than this. However, nearly all of the larger manufacturers built additions to their works and installed new equipment for increasing production this year, and at the tractor show held in Kansas City, Mo., recently, there were a number of manufacturers who confidently predicted that the total number made this year would reach 100,000.

Henry Ford & Son, Detroit, who recently built a new plant to manufacture a light tractor of Mr. Ford's invention, shipped about 7000 of these to our Allies during the past few months and these will be available for use in England and France for spring cultivation. Undoubtedly the Ford plant will soon be able to accept some domestic orders, though for a considerable time it was working almost exclusively on foreign business.

The Holt Mfg. Co., which has three large plants, has applied its output for the past three years largely to Allied and United States military requirements. Extensive additions have been made to its plants and much new equipment has been purchased.

The Phoenix Mfg. Co., Eau Claire, Wis., has been spending a great deal of time in developing a special machine for Government use, and when these experiments are successfully concluded, its manufacture may be begun on a considerable scale, which will involve the purchase of new equipment.

The Allis-Chalmers Mfg. Co., Milwaukee, Wis., entered upon the manufacture of tractors about three years ago. Tractors have not been, until this year, one of the company's important lines, but several additional types will be brought out in the near future, and increasingly more attention will be devoted to this branch of its business.

The Elgin Tractor Corporation, Piqua, Ohio, will make from 1000 to 1200 tractors this year. A new machine shop has recently been completed and indications are that within the next 12 months another section will be added, equalling the present plant. This company makes a 3300-lb. tractor, of which the frame, rear axle and certain small parts are of alloy steel.

The Buda Co., Harvey, Ill., is engaged in increasing the size of its plant to meet a large demand for its tractors and has been a buyer of new machine-tool equipment within recent months.

The Mayer Brothers Co., Mankato, Minn., has tripled its production of tractors since last May.

The Hart-Parr Co., Charles City, Iowa, one of the pioneers in tractor manufacture, has been building these machines for more than 16 years and has considerably expanded in the last few years, now claiming to have the largest exclusive tractor plant in the world. The company has its own steel and gray iron foundries and makes all parts from the raw material to the finished product. This company writes: "The next three years will see a tremendous growth in our establishment as well as our competitors'. The tractor industry will be second to none in a very short time. This is our firm belief."

The Avery Co., Peoria, Ill., has greatly increased its output in the past two years.

The J. I. Case Threshing Machine Co., Racine, Wis., has added considerably to its facilities for making tractors.

The Cleveland Tractor Co., Cleveland, made its first tractor in the fall of 1916 and in January, 1917, began the manufacture of them in a building 60 x 250 ft. During 1917 an addition, 60 x 300 ft. was erected; a new factory building, 60 x 460 ft., a boiler and hardening room, 80 x 90 ft. and an annex to this of 90 x 200 ft. were also built. From April to Dec. 31, 1917, the company made 1032 tractors, but during 1918 its output will possibly reach 10,000 machines. This is a striking example of the rapidity with which the industry has grown.

The Pioneer Tractor Mfg. Co., Winona, Minn., has installed considerable new machinery and this year will double its 1917 output.

The Electric Wheel Co., Quincy, Ill., doubled the capacity of its plant a year ago and is now doubling it again, putting up a new building which will cover 17,400 sq. ft. of floor space.

The Moline Plow Co., Rock Island, Ill., started to build tractors more than two years ago and has since developed a tractor manufacturing organization of 1300 employees and its factories devoted to this work cover 325,000 sq. ft., and have a capacity of 70 tractors a day. The Moline Plow Co. has recently been a large buyer of machine-tool equipment for this plant.

Sheet metal workers in the Youngstown. Ohio, districts have asked for a wage increase of from $5.00 to $6.40 per day, or an 8-hour day at 80c. per hour, dating from May 1 next. It is not known whether the employers will grant the increase, and they are now getting data as to wages being paid sheet metal workers in other places. It is probable the men will be asked to accept a compromise.

The Cameron Clay Products Co., maker of fire clay and firebrick shapes, has moved its main office to Emporium, Pa.

Pittsburgh and Nearby Districts

A printed report that the Government might take over the plants of the Blaw-Knox Co., at Hoboken, Pa., and Wheatland, Pa., is officially denied. This concern is turning out Government work in very large quantities at both its plants, but there is no intention on the part of the Government to take over either works.

The Crucible Steel Co. of America has filed three supplementary affidavits of defense in the United States district court at Pittsburgh, protesting against payment to railroads of charges for hauling slag. Judge W. S. H. Thomson, of Federal court, recently held that iron and steel manufacturers are liable for freight charges for the movement of slag regardless of its disposal by the carriers. Manufacturers contend that the railroads use a great quantity of slag for useful purposes, and therefore no charge should be made. Final settlement probably will not be made until it has been passed upon by the Supreme Court.

It is probable that the testing plant of the Bureau of Standards will be moved from Pittsburgh to Washington. Dr. Stratton, chief of the Bureau of Standards at Washington, D. C., recently made a statement regarding its plans at Washington as follows:

> The one building for the standardization of equipment, and in which our metallurgical plant will be placed, will cost $200,000, and the other, which will serve as a testing plant for material for the military departments and handle all of the structural materials work that is now carried on at Pittsburgh, will cost probably $500,000 or $600,000. Our structural materials work, which includes this class of work—the clay products and metal work—as you know, has been carried on temporarily at Pittsburgh in buildings loaned by the War Department; it has been carried on there for the last eight or ten years.
>
> It has been a most undesirable place to work, and now they have taken the old arsenal grounds, as I have always said they would when our work is located, for storage purposes the minute we got into war. They need these buildings as a storage plant and they have surrounded our buildings with tracks, and so, temporarily, we are walled in. They have been very good to us, however, and say that we need not get out of those buildings until new ones are provided, but the work has become of such importance that it is exceedingly unwise to go on with it under the present conditions.

Dr. Stratton also said that as soon as the buildings at Washington are ready the equipment will be removed from Pittsburgh.

In order to complete a deal for the sale of Greene county, Pa., coal lands owned by J. V. Thompson, the well-known coal and coke operator of Uniontown, Pa., trustees in bankruptcy of Mr. Thompson have petitioned the United States District Court at Pittsburgh for permission to dispose of the lands to Joseph G. Butler, Jr., of Youngstown, Ohio, for $3,627,846, an agreement having been entered into with Mr. Butler for the blanket sale of the property. In order to consummate the sale the trustees must get 78 holders of mortgages and 1580 judgments to temporarily relinquish their claims, in order that clear title may be conveyed. These lien holders live in 10 states of the United States, and some of them are abroad. Federal Judge Charles P. Orr ordered the trustees to fix a day for a hearing, when holders of liens may appear to give their consent to the sale.

Residents of the boroughs of Swissvale and Edgewood, Pa., have opened their homes to girls who are employed by the Union Switch & Signal Co., a subsidiary of the Westinghouse Air Brake Co., in the aircraft department on Government contracts. Already rooms have been secured for 300 girls, although the company as yet has only about 100 girls in its employ, but it is planning to increase this number to between 1000 and 1500. The company has appointed a housing committee which is inspecting the homes which have been opened for the girls, where they are enjoying all of the comforts available to the residents themselves. Many of the homes never have been opened before to outsiders. The company is also building a rest room and cafeteria with a capacity of 1000, and will serve three meals a day. The company now serves the girls with coffee and cocoa.

The Masseth Packer & Machine Co. has been incorporated in Pennsylvania with a capital stock of $50,000 to manufacture machinery and tools. Lawrence K. Cornelius, Butler, Pa., is treasurer.

The Iron Trade Products Co. has been incorporated in Pennsylvania with a capital stock of $25,000 to deal in iron, steel, coal, etc. E. B. Strassburger, 5651 Beacon Street, Pittsburgh, is treasurer.

The Fayette Mine Car Co. has been incorporated in Pennsylvania with a capital stock of $25,000 to manufacture mine cars. A. C. Stickel, Connellsville, Pa., is treasurer.

Pig Iron Cars Three Months on a Siding

In their pig iron market report of March 16 the Matthew Addy Co., Cincinnati, makes this comment on railroad conditions as affecting the transportation of pig iron: "As illustrating what has happened to the railroads, we had iron shipped from Alabama in early December which was delivered in March. We know of several cars which were delivered in December on a siding in a Southern furnace town and which were not switched to the plant to which they were consigned until last week. That meant that the cars were locked up, idle, out of use. Those cars in ordinary times would have made half a dozen round trips and normally could have done from six to twelve times the amount of work they really did. This is why empties have been so scarce, and this is why industry has been so hampered by the railroads. The specific cases we have cited can be multiplied a thousand times. Now that we are having seasonable weather the railroad deadlock is being slowly unlocked."

Electrochemical Society's Spring Meeting

The spring meeting of the American Electrochemical Society will be of a different nature from what is customary. The board of directors has decided that it will be held in the South during the week of April 28. The society will make a trip of one week through the chemical, electrochemical and metallurgical centers of the South. Over 80 members and guests have agreed to go. Railroad officials anticipate no difficulty in arranging transportation. It is planned to leave Washington, D. C., Sunday evening, April 28, and spend one day in each of the following centers or districts: Kingsport, Knoxville and Chattanooga, Tenn.; Sheffield and Birmingham, Ala. Technical papers will be presented each evening. On the return trip the party will arrive in Washington, Sunday, May 5. Arrangements are in charge of a committee headed by C. F. Roth, who may be addressed at Grand Central Palace, New York.

Electric Iron Smelting in Sweden

According to a report on the Swedish pig-iron industry from the British Minister at Stockholm, the electricity generated at Porjus is used for operating the state railroad from the iron mines to the sea, and the originator of the new smelting works at Porjus contracted for all the surplus current, thus obtaining the advantages of the cheapest electric power in Sweden and also a well-equipped electric mineral railroad to haul his products to an ice-free sea port. Three furnaces have been erected, with a weekly capacity of 150, 70 and 65 tons respectively. The most up-to-date electric appliances have been introduced and it is calculated that the works will produce from 7000 to 10,000 tons of pig iron a year. With extensions that are in course of construction it is estimated that the output in 1918 will be increased by a further 10,000 tons.

An immediate installation of a 7500-kw. turbo-generator in the No. 1 power station of the Ensley furnaces has been authorized by the Tennessee Coal, Iron & Railroad Co., and a coal mine on the Blue Creek seam is to be opened.

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War Contracts for the Little Plant

Metal-working plants which have not yet taken war orders are not likely to do so for a good many months. Our war program does not appear large enough to tax the country's productive capacity. This seems to be true even in view of reduced manufacturing activity resulting from diminished domestic demand. Even with the increasing numbers taken into the army by the draft, an acute labor shortage has not developed, but instead a high turnover, growing out of plenty of jobs to be sure, but also out of unsatisfactory living and working conditions. Were our present scale of war manufacturing big enough to absorb our industrial capacity, there would not be sufficient ship space to carry away the product nor indeed adequate railroad facilities with so much of the movement in the same general direction—to the Atlantic seaboard.

The chafing of the average manufacturing company to do some war work comes from the impression that with things being done on a like gigantic scale all the United States must become an intensive munition producer just as did all Canada. One great difference is that Canada early became one huge shell machining camp and could utilize all sorts of plants, while this country is going also into the making of heavy guns and is now busy making the heavy machine tools required for this purpose. Few plants are adapted to such work; but admitting this, manufacturers have viewed with concern the building of new large industrial ventures under virtually a Government subsidy, as for aeroplane parts, when with slight modifications and adjustments they feel they could undertake small contracts for the small work and without asking labor to take up new abodes in congested or out of the way spots. While it may be that over-emphasis has been put by the Government on the desirability of letting work in specially large amounts and thus only to our largest establishments, we are facing the fact that the bulk of the letting has been done and no change of moment is to be expected until the 1919 program is put under way.

What expansion there may be months hence, when an accelerated shipbuilding output and decelerated submarine ravages give more ocean-carrying capacity cannot be foretold; but meanwhile the owner of the metal-working plant needs to keep up his search for business in the usual way without holding much deck space clean for the elusive war contract.

A Priority Hardship

From E. C. Douglas, president of W. & B. Douglas, manufacturers of pumps, Middletown, Conn., we have the following letter dealing with a very serious drawback to the present plan of supervising pig iron shipments:

> We are finding it increasingly difficult to obtain pig iron and some of the furnaces are requesting us to tell them where every bit of our castings goes, so as to insure their getting plenty of coke to operate. It seems to us that the Government method of distributing iron and coke does not bear sufficiently in mind the fact that many of us are making goods for stock, which will be ultimately used by the Government, but which have not been ordered by the Government at the time we start the castings.
>
> If nobody makes any chucks, pumps, grinders, milling machines, etc., for stock purposes and plans no stock batches ahead except as Uncle Sam might direct, what would become of the "open market" which the Government depends upon for a number of its supplies?
>
> The Government's theory seems to be that every one who is selling goods to the United States has a great big contract requiring months to complete, the exact tonnage for which can be figured out in advance. As a matter of fact, most of our Government orders, until very recently, have been small orders for goods taken from the shelf. Doubtless many other manufacturers are in the same predicament. But when it comes to obtaining iron to replace goods sold in this manner we must prove that we wish to use it on a certain Government order; but this cannot be done, because the order doesn't exist at the time we start the castings.

The hardship to which Mr. Douglas directs attention is a real one, and THE IRON AGE has heard of it from a number of consumers of pig iron in other lines. On the face of the statement some remedy is called for, and the question is commended to the careful consideration of the priority authorities at Washington. It is evident at the same time that the remedy must be applied without opening the door to indiscriminate claims to a share in

the pig iron output on the ground that at some time in the future the product into which the pig iron enters will be called for by the Government or by a firm having in hand a Government contract. It is quite true, as the letter urges, that in many cases manufacturers of products in common use and which are likely to be called for in connection with Government contracts cannot say, when they are beginning work on a batch of castings, that these castings are for the Government. No doubt the allocation of a certain supply of pig iron to such companies might be secured by showing the extent to which their product in the previous three months or six months had been devoted to Government or Government contract uses.

Apart from a resort to some such method of identification with Government work, one influence will work in favor of firms in this class, and that is a gradually increasing supply of pig iron. As times goes on, the tendency will be for the Fuel Administration, in co-operation with those in charge of iron and steel supply, to make the supply of coke go to the farthest extent possible in pig iron production. There may be hardship to some of the smaller blast furnaces, but in the interest of conservation it is to be expected that the authorities at Washington will aim to distribute the fuel supply with a view to getting out of it the largest yield of pig iron and steel. That might mean that a furnace capable of producing 350 to 400 tons of pig iron a day, with a coke consumption of 2200 to 2300 lb. per ton of iron, would get coke enough to run to capacity rather than having to pro-rate coke with a furnace of 100 tons daily capacity using 2500 to 2600 lb. of coke to produce a ton of iron.

War and Other Steel Consumption

There has been noticed for months past a continued decrease in the consumption of steel for ordinary commercial purposes, entirely disconnected from war activities, and as the extent of war requirements becomes somewhat less hazy more disposition appears to canvass the prospects for steel consumption in general.

How great has been the diversion of steel from peace to war purposes no one has attempted to estimate definitely, but in a number of cases the change has been one in name rather than in substance. It has been a common practice among steel mills to regard as "war steel" the material they ship to consuming industries that have been specifically named as helpful in winning the war. Thus since crude oil and gasoline are both very essential as war supplies, steel furnished the petroleum industry is war steel. It is, however, the same steel as formerly and is used in the same way. A similar change in classification is now to occur with respect to railroad material. Cars and locomotives are to be bought, and probably by the individual roads, under Washington supervision, and the roads will pay for them, but the steel will be "war steel," while formerly the same steel was commercial steel. Inasmuch as the inception of the program comes at a time when the car shops have almost exhausted their orders, having received practically no orders from domestic roads for ten months past, the business will not represent, *in toto*, an addition to the demand for steel.

Without a great deal of difficulty the car and locomotive shops can probably be speeded up within a few months to a rate of consuming, say, 300,000 gross tons a month of finished rolled steel. The shell steel program for the second half of this year contemplates 2,500,000 tons, or say 400,000 tons a month. Shipbuilding, about which there has been so much confusion of tongues, even to the extent of comparing vessel sinkings in terms of one ton with vessel construction in terms of a totally different ton, presents perhaps the greatest uncertainty. When a rate of construction of 500,000 deadweight tons a month is reached, the consumption of rolled steel will be in the neighborhood of 250,000 to 300,000 gross tons a month, that representing about 750,000 net register tonnage. There is question whether such a rate will be attained before the end of this year, but as long as a fairly high rate is not reached there will still be steel consumption in the form of equipment for shipyards and various shops serving shipyards, so that it may be taken as a general prospect, roughly speaking, that rolling stock, shells and shipbuilding are going to consume in the neighborhood of a million gross tons of rolled steel a month.

There are various other war requirements, the most important single item being the requirements of our Allies. While exports continue, with their monthly ups and downs, the burden upon the mills has been small of late by reason of the large stocks that accumulated at seaboard. When these are disposed of the mills will be called upon to roll more material for export.

The full productive capacity may be taken at about 3,000,000 gross tons of finished rolled steel a month, which is 18 per cent more than the actual production in 1916. Assuming total war requirements, including exports, at 1,500,000 tons a month, and a possible operation at 90 per cent of steel capacity, there would be left 1,200,000 tons of finished steel a month for purposes not referred to above. That is about 70 per cent of the domestic consumption in 1912 and 1913, two good years on the whole, and when there was considerable consumption in building cars and locomotives, now counted as a war activity, and when there was considerable building, an industry now dormant except in connection with prosecuting the war. The question thus comes up whether there is not as much ground for concern regarding demand as concern regarding supply in the matter of steel.

Sulphur in Steel Castings

Necessity and not experimentation or theory may decide whether sulphur is detrimental to steel castings. It has been a point of contention among metallurgists and others whether sulphur is really an objectionable element in rolled steel products or even in castings when present considerably in excess of the average specification.

Before the war Government and railroad requirements imposed a maximum for sulphur of

0.05 per cent in castings, and in some cases 0.04 per cent was the limit. Under normal conditions these were not difficult to meet in steel made by the acid and basic open-hearth, the crucible and electric processes. The converter process always has had its troubles in this respect.

The war has changed conditions materially. Most Government castings are made by the acid open-hearth and converter processes. According to the experience of the largest producers of such castings in the most important district in this country, it is now practically impossible to turn out steel which will meet the old specifications. The raw materials, both the pig iron and the scrap, are higher in sulphur. The result has been that users of such castings are now accepting without question metal running 0.06 per cent of sulphur and higher, made in the acid open-hearth, and still higher sulphur steel in converter castings. There seems to be no trouble with the metal when carefully and properly made. Before the war rejections for high sulphur were sometimes serious to the producer.

It is perhaps too soon to decide whether sulphur somewhat beyond previous specification limits is unobjectionable in castings. The endurance of such material in service, particularly in war, may bring out valuable information. At least it is well that the issue is so forced that the matter can be threshed out on a large scale, and not experimentally or theoretically. It cannot be gainsaid that requirements introduced in specifications are often based on theory and not on practice, resulting in hardship and loss to the steelmaker.

Ocean Commerce Continues

Vessel clearances from ports of the United States, in net register tons, amounted to 53,190,959 tons in 1916 and 49,597,442 tons in 1917. The decrease is 6.75 per cent.

The showing is not a bad one. There were 11 months of the ruthless submarine activity in 1917, and the inception of that campaign caused a postponement of weeks in many vessel sailings. The interned German vessels since put into service did not contribute to the 1917 sailings to any extent, although they are now rendering very acceptable service. It may be assumed, furthermore, that the official statistics of vessel clearances do not include the movement of vessels in control of the United States Government, and those vessels perform, on the whole, the most useful function of all.

It is frequently assumed that merchandise exports have been maintained at the very satisfactory rate of recent months partly by the diversion of many vessels from the making of long trips to the short transatlantic journey, as well as by an increase in valuations per unit of measurement of the merchandise. That there was no great change in the vessel movement making up the total clearances cited, however, is shown by the accompanying tabulation of net tonnage cleared as to destination.

Toward the close of 1916 and before the new submarine menace was announced, it was the expressed opinion of many experts engaged in the export trade that it would be impossible to export nearly as much merchandise in 1917 as had been moved in 1916, because vessels would be lacking. Even with the new submarine campaign as an additional deterrent influence, however, the vessel clearances, as indicated above, showed a decrease of only 6.75 per cent, with sailings of Government vessels presumably not counted, while the reported

Destination of Tonnage	1916	1917
Europe	19,890,426	16,213,633
North America	27,414,107	28,504,599
South America	2,946,654	2,360,251
Asia	1,701,338	1,670,776
Oceania	678,735	527,734
Africa	559,699	320,449
Total	53,190,959	49,597,442

value of merchandise exported rose from $5,422,642,505 to $6,167,205,388, or by 13.7 per cent.

This is the showing for a year which included 11 months of a submarine campaign that was expected to alter the fortunes of war within a few months.

As to the future, the trends in all the curves by which the submarine menace are studied are favorable. These include the vessel sinkings, the capture and destruction of submarines, the rate at which they are being built, the rate at which means for destruction of submarines are increased, and the rate at which ships are being built. Statements that the submarine is being held, or that the submarine menace is being taken care of, mean simply that up to date these curves are favorable. In no direction is it permissible that there should be any relaxation. All the means for destroying submarines and for increasing the available vessel tonnage must be employed, and with the utmost possible vigor. It is not merely necessary to overcome the submarine eventually. It is necessary to overcome it as speedily as possible. Every day by which that time can be brought nearer is a definite and concrete item in the work.

American Steel in Italy

The iron and steel that was largely imported into Italy before the war from England and Germany is now coming from the United States. The Italian output has never been sufficient to meet normal demands. Commenting on present conditions, U. S. Consul Joseph E. Haven, of Turin, Italy, has this to say:

> The iron and steel imported from England for war purposes was slow in consignments, which fact has afforded an opportunity for American manufacturers to supply the Italian market with both semi-finished and finished iron and steel. American products and mechanical skill appear to be appreciated by the Italian industries after the good results obtained with American material, and particular mention may be made of machinery, such as agricultural implements, tractors, etc. It is believed that a good advertising campaign, in the Italian language, on the part of American manufacturers would be greatly inducive to an extensive after-war trade.

The Indianapolis branch of the National Metal Trades Association will hold its twelfth annual meeting and dinner at the Claypool Hotel, Monday evening, March 25. The address will be delivered by Charles Piez, vice-president and general manager of the Emergency Fleet Corporation. Alfred Kauffmann, Link-Belt Co., is president of the Indianapolis branch; H. G. Myers, Chandler & Taylor Co., vice-president; L. M. Wainwright, Diamond Chain & Mfg. Co., treasurer, and A. J. Allen, secretary.

ORE RATE DECISION

Commission Favors Giving Furnaces Benefit of Their Location

WASHINGTON, March 19.—That Monessen and Donora may not properly be grouped either with Johnstown or Pittsburgh for the purpose of making rates for the transportation of iron ore in carloads from the lower Lake Erie ports, but that a reasonable and just rate for the line-haul service will be one which does not exceed by more than 6 cents per long ton the rate contemporaneously charged by the carriers to points in the Pittsburgh-Wheeling group, has just been decided by the Interstate Commerce Commission in a supplemental report in the iron ore rate cases. The complainants in this important case include the Pittsburgh Steel Co., Carnegie Steel Co., Youngstown Sheet & Tube Co. and other leading steel producers of the affected districts.

In the original report in these cases certain changes were made in the existing grouping of Monessen and Donora from the Pittsburgh rate group to the Johnstown group. The respondent carriers were then required to submit for approval amended rates, charges, rules and regulations in conformity with the findings and upon supplemental proceedings the adjustments presented by the carriers were in part approved, but the important question of the grouping of Monessen and Donora was left open pending further examination. The Donora furnace men entered a general objection to the proposed change, and there was a most strenuous protest on the part of Monessen against being placed in a higher rate territory than before.

The Pittsburgh Steel Co. strongly resisted the removal of Monessen from the Pittsburgh group, alleging that the Pittsburgh district was established and built up as the result of natural commercial conditions and with strict regard to the principles of grouping recognized by the commission.

The so-called independent steel interests of the Youngstown group argued that if Donora and Monessen were to be retained in the Pittsburgh-Wheeling group, then in all fairness the furnace points of Leetonia, New Castle and Dover, formerly taking the same rate on iron ore as the furnaces in the Youngstown group, should also be reinstated in that group, and that every argument for retaining Donora and Monessen in the Pittsburgh-Wheeling group applies with equal force to the other points mentioned.

On the part of the carriers, it was asserted that if left to their own judgment they would not have disturbed the grouping of Donora and Monessen in the Pittsburgh district, and they were not opposed to the retention of these points in that district. The carriers insisted, however, that, in the event Monessen and Donora were continued permanently in the Pittsburgh-Wheeling group, the line-haul rates to that group should be increased by 4 cents per long ton, in order to give to the carriers serving those two points the revenue that would accrue to them under the rates and grouping proposed in the original report.

All these arguments, the commission in its final report declares, overlook the essential character of the investigation conducted in these cases. This inquiry involved not only the reasonableness of rates rules and regulations and practices applicable to shipments of iron ore but also whether the grouping of lake ports and destination points was reasonable and free from unlawful discriminations. The facts developed seem to indicate that the grouping of destination points prior to the investigation was the underlying cause of many of the complaints and contentions, and that the existing groups were established largely, if not wholly, to equalize the cost of pig-iron production. The commission declares that no reason appears why each furnace plant should not be accorded, so far as practicable, the benefit of its location with relation to the lake ports. This is a familiar principle of frequent and ordinary application in the construction of rates.

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HOUSING BILL DELAYED

Opposition Develops, but Amended Measure Will Doubtless Be Passed

WASHINGTON, March 19.—The project involving the expenditure of $50,000,000 for housing for munition plants and other private establishments having Government contracts will probably be somewhat delayed as a result of efforts now being made by the Department of Labor to secure important amendments to the bill now before the House Committee on Public Buildings and Grounds. It is also possible that the measure will encounter some opposition on the floor of the House incited by certain leaders of organized labor who, either wilfully or as the result of misinformation, are misrepresenting to their followers the real objects of the proposed legislation. The Administration and the House leaders, however, are determined that the project shall be put through as speedily as possible, and in view of the influences now at work in its behalf there is reason to believe the necessary legislation will be provided within the next 30 days.

There is no reasonable basis upon which organized labor can oppose this important measure. The objects of the bill are set forth in clear terms and do not admit of any misunderstanding.

The opposition of labor to this measure is said to be based upon statements made by certain labor leaders that the workmen employed in plants for which the Government will provide housing are to be exploited in various ways. According to one report all workmen employed in plants having Government housing will be compelled to live therein regardless of the availability of other accommodations. Another misrepresentation is to the effect that skilled workmen receiving a certain rate of compensation will be required to purchase the houses provided by the Government on terms to be prescribed by the Secretary of Labor. Other rumors industriously circulated relate to company stores which it is said Government-aided plants will establish and which the workers in such plants will be compelled to patronize.

It can be stated on the highest authority that these reports are without the slightest foundation in fact. There will be absolutely nothing compulsory about the project and workmen will not be urged to purchase homes, although they will be granted the most favorable terms, should they desire to do so. In many cases, however, the plans of the Housing Bureau do not contemplate permanent structures, and of course in such cases the homes provided for the workers would not be for sale. As in the case of the housing plans already approved for the shipping board, there will be a very stringent regulation of any public or semi-public facilities that may be provided either by the Government or by the plant owners on property upon which homes will be built with Government funds.

The changes sought in the housing bill, as introduced by Representative Clark, chairman of the House Committee on Public Buildings and Grounds, were outlined by Director Otto Eidlitz of the Housing Bureau to the committee at a hearing yesterday morning, and will probably be adopted in the draft of the bill that will be reported to the House this week. Mr. Eidlitz suggested that the provision of the bill prohibiting cost-plus-profit contracts be strengthened so as to provide that "no work or contract done or made under or by authority of any provision of this act shall be done or made on or under a percentage of cost-plus-percentage basis." In this connection he told the committee it was the intention of the Secretary of Labor to safeguard the interests of the Government in every way to prevent contractors from securing exorbitant fees, and especially from allowing costs to run above reasonable levels.

The Trumbull Steel Co., Warren, Ohio, poured the first heat in its new open-hearth plant March 9. Three of its seven new furnaces are completed, and two of these will be operated now and the third one will be started up a little later.

HOIST MAKERS ORGANIZE

Electric Hoist Manufacturers' Association Aims at Standardization of Product

The Electric Hoist Manufacturers' Association has been organized by the following manufacturers: Brown Hoisting Machinery Co., Cleveland; Detroit Hoist & Machine Co., Detroit; Euclid Crane & Hoist Co., Euclid, Ohio; the Franklin Moore Co., Winsted, Conn.; Link-Belt Co., Philadelphia; Roeper Crane & Hoist Works, Reading, Pa.; Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.; Sprague Electric Works of General Electric Co., New York, and Yale & Towne Mfg. Co., New York. These officers were elected: F. A. Hatch, Shepard Electric Crane & Hoist Co., chairman; F. W. Hall, Sprague Electric Works of the General Electric Co., vice-chairman; C. W. Beaver, Yale & Towne Mfg. Co., secretary-treasurer.

"The association will hold monthly meetings for the purpose of studying the specific needs of the hoist user and to develop standardized methods of presenting information to him so that guess-work will be eliminated," says a statement which has been issued. "The association will consider uniform nomenclature pertaining to types and parts of electric hoists, fix upon a standard by which hoist motors shall be rated and promote the standardization of electric hoists so far as possible. It will also collect and disseminate information and statistics relative to the electric hoist industry, provide facilities and opportunities for study and education in regard to the economics of the industry, extend the use of the product by pointing out the great number of material-handling problems of different classes that can be solved by the use of electric hoists, promote a friendly intercourse and co-operation among the members and disseminate information that long experience has taught is essential to any hoist to insure good results and to recommend to the members of the association well-established principles, both as to the construction and equipment that will tend to eliminate any possibility of inferior product."

The membership of the association is confined to those engaged in the manufacture of monorail electric hoists. At its last meeting, the association adopted a resolution offering the services of the member companies to the Government in meeting the extraordinary demand for their product. The War Industries Board has requested full information concerning the ability of the electric hoist manufacturers to handle the volume of business offered them, as well as what effect priority orders and embargoes on shipments have had upon the trade. In this connection, the association makes the following formal statement:

It is evident that the association will be of great assistance to the War Industries Board, as it is becoming more apparent from day to day that there are numerous advantages for all concerned to have manufacturers in certain lines organized, especially now, in the hour of the nation's greatest need, and instead of vindictive competition and antagonism along business lines, the spirit of co-operation and exchange of ideas, looking toward increased output, should prevail.

Electric hoists for shop use and handling material have gone through various stages of development during the past 15 years and like all classes of shop machines, they cannot be successfully designed on the basis of theory alone. Actual experience in meeting hoist requirements and innumerable corrections and refinements in design on the part of the manufacturers have marked the progress made during these past 15 years in this important field.

The many mistakes, both on the part of the manufacturer and the user during this development period have in some instances created a lack of confidence in electric hoists as a class. On the other hand, many users have been led to believe that such hoists are unaffected by abuse and can consistently be called "fool-proof."

Some discredit to these machines has developed on account of lack of standardization in nomenclature, service rating and general characteristics on the part of the makers. Now that it is thought that the experimental stage has been well passed and acceptable designs developed by various manufacturers, it seems wise to co-ordinate the total experience and to make available for the user all that is best in electric hoist design and practice.

PRICE FIXING COMMITTEE

Created by War Industries Board to Secure Speedy Adjustments as Needed

WASHINGTON, March 19.—The War Industries Board, acting under authority conferred upon it by the President, has created a body to be known as the Price Fixing Committee, with its personnel composed of Robert S. Brookings of the War Industries Board, chairman; Brigadier-General Palmer E. Pierce, surveyor general of supplies for the War Department; Paymaster John Hancock of the bureau of supplies and accounts of the Navy; Dr. H. A. Garfield, Fuel Administrator; F. W. Taussig, chairman of the United States Tariff Commission; W. J. Harris, chairman of the Federal Trade Commission; Hugh Frayne of the War Industries Board, and Bernard M. Baruch, ex-officio. Another civilian member of the committee will later be appointed.

"The duties of the Price Fixing Committee," says an official statement made by the War Industries Board to-day, "will be to pass upon prices for all basic raw materials and to establish from time to time a price fixing policy to be submitted to the President for approval. Any of the executive departments having difficulty in the handling of price fixing matters will have the advice and assistance of the Price Fixing Committee when desired.

"The object of the Price Fixing Committee is twofold. First, it will be a separate body, quasi-judicial in nature, for the purpose implied in its name and it will serve this purpose through being made up of men separated so completely from industrial interests that their motives and actions in the determination of prices can be subject to no suspicion of mercenary interest. Prices will not be made until after costs have been passed upon by the Federal Trade Commission. With costs as a basis, the Price Fixing Committee will then consider problems of production and distribution before arriving at its decisions.

"The second object to be achieved by the Price Fixing Committee is speed. The committee will sit all the time and will thus eliminate unnecessary delay caused by the consideration of price fixing problems in several different quarters."

The first duty of the Price Fixing Committee will be one of the most important that it is likely to be called upon to discharge. To-morrow it will meet the general committee on iron and steel products of the American Iron and Steel Institute to consider the extension and possible revision of the schedule of controlled prices which expires on March 31. In view of the importance of the occasion and because of his past experience in this work, it is believed that Mr. Baruch who, it will be noted, is ex-officio a member of the Price Fixing Committee, will attend the conference and take an important part in its deliberations.

What the Move Foreshadows

The appointment of this committee is believed here to foreshadow a very substantial development and extension of the policy of the Administration to fix the prices of products essential both to the conduct of the war and the general welfare of the people. The concentration of this work in the hands of a single body is counted upon to facilitate the making of decisions and to co-ordinate the methods pursued in cost-finding and in the determination of fair prices. Much information will be gathered by the committee in the course of its work that will be of constantly increasing value and available in meeting new problems as they arise.

It is of no little importance that the War Industries Board has seen fit to give a place on the Price Fixing Committee to Fuel Administrator Garfield. The close relation which the cost of fuel bears to all the leading interests of the country is a matter of such importance that it will be to the great advantage of all industries the products of which are to be subjected to price fixing that the fuel administrator will have a part in all conferences.

The appointment of Professor Taussig to the new committee will at once place at its disposal a vast amount of material relating to production costs which has been gathered as a basis for possible tariff revision. The work done by the tariff commission in this connection has been far more comprehensive than that of the trade commission, the investigations of which have been limited almost wholly to inquiries authorized or directed by Congress.

Hugh Frayne is the representative of labor on the War Industries Board, and will be relied on to supply information as to wages and other labor conditions. With Professor Taussig and with Chairman Harris of the Federal Trade Commission he will cooperate in determining labor costs.

Future of the Pomerene Price-Fixing Bill

The future of the Pomerene steel price-fixing bill is believed to rest ultimately with the Price Fixing Committee. Congress will not pass this measure without the acquiescence of the President, and it is believed the President will not recommend its enactment if the new committee finds itself able to accomplish by negotiation what the bill is intended to bring about. Should the President at any time advise Congress that the passage of the Pomerene bill is necessary to enable the Government to secure an ample supply of iron and steel at reasonable prices, there is little doubt the measure would be rushed through both houses within 30 days.

The President sincerely hopes that the organization of the new Price Fixing Committee will put an end to the scandals that have discredited in large part some of the most efficient work performed by the War Industries Board. Notwithstanding the disinterestedness of the able business men who have devoted their time without compensation to purchasing enormous quantities of important materials, certain unfortunate incidents have occurred, affording opportunity for the personal gain of former business friends and associates, and, although no specific instances of absolute wrongdoing have come to light, yet the impression made upon Congress, and especially upon the public through highly colored newspaper accounts, has been very unfavorable. The new price-fixing organization will be made up of men who are in no way active in business, and who are not connected with any interest with which the committee will be called upon to deal. It is to be assumed that specialists more or less remotely connected with the leading industries will continue to advise the Government as to where goods can be procured but all the price fixing will fall to the new committee.

W. L. C.

Buys Coal Lands

PITTSBURGH, March 19 (*By Wire*).—J. H. Hillman, Jr., of J. H. Hillman & Sons Co., Oliver Building, Pittsburgh, dealer in coal and coke lands and large manufacturer of blast furnace and foundry coke, has bought a tract of 260 acres of coal lands in Redstone Township, near Uniontown, Pa., for $468,000, or $1,800 per acre. This coal tract was purchased by Mr. Hillman directly from R. M. Fry, who had an option on it. The land lies adjacent to a large coke works now in operation, in which Mr. Hillman is interested. While no definite plans have been made as to what use will be made of this coal tract, it will likely be developed by the coke interest whose property it adjoins.

The offices of Hickman & Williams, dealers in ore, pig iron, coal and coke and ferroalloys, have been removed from the twenty-fourth floor to rooms 1344 to 1348, Oliver Building, Pittsburgh. On and after April 1 the concern will also occupy rooms 1342 and 1343, giving a suite of seven rooms in that building.

The Newport News Shipbuilding & Drydock Co., Newport News, Va., will build a series of two-story houses at Hilton, near Newport News, for its employees, at a total cost of about $1,500,000.

Iron and Steel Markets

SLIGHT CHANGES IN PRICE

A Possible Reduction in Basic Pig Iron

Operation of Smaller Plants Involved in Government Priority Decisions

Iron and steel manufacturers entered the price conference with the War Industries Board at Washington Wednesday knowing that they would be asked to make reductions on some products, particularly pig iron. Producers of foundry iron strongly oppose lower prices, and a compromise may be made by reducing basic iron $1, or to $32, and Bessemer iron, which is 10 per cent higher, from $36.30 to $35.20. There is a probability, too, of some downward revision in scrap, in certain forms of which competition has already brought reductions from the Government basis.

On some finished products, which have been considered out of line, the Government will also seek reductions. How strongly these will be pressed depends upon the extent to which Washington considers the output of smaller high-cost plants to be essential to the carrying out of its program. On the score of securing the largest possible output of pig iron and steel from the available coke, current priority decisions tend more and more to throw smaller iron and steel plants into idleness, and the development of this policy is being watched closely throughout the industry.

No material or general readjustment of existing prices for rolled products is looked for, and the steel men contend that the uncertainties of the situation which are already affecting demand should be removed by making the new prices effective for at least six months.

Apart from the special plea of two large consuming interests for a reduction in Southern pig iron, because they located plants in the South to get the benefit of its low pig iron costs, manufacturing buyers of iron and steel figure in no formal way in the present Washington conference.

Somewhat conflicting statements are made as to the extent to which Government and general business needs will take up steel making capacity in the remainder of the year. That the shipyard, railroad and shell steel programs will make progressively larger demands on the mills in the second half is known, but the second quarter may show some bare places in operating schedules. The slowing down of certain lines is apparent now, due to the slackness of building, lessened automobile buying, the long suppression of railroad demand and the shrinkage in various non-essential industries. The output of certain kinds of foundries is less.

At the same time there is some pressure upon the mills for deliveries. Plates for locomotives are an example; but here the trouble has been largely in the East, resulting directly from the fuel fiasco of last month. To meet the immediate urgent demand for ship plates, more use is to be made of the product of universal mills, in spite of the extra riveted seams involved and the difficulty of caulking the rolled edges of such plates.

In heavy products Government requirements in the second half of the year may at times make demands that will tax capacity. The call for rails and large rounds as now figured will be considerably more than a six months' output of the country's rail mills. But structural mills, with building so much curtailed, can take a part of the 2,500,000 tons of shell steel scheduled for the second half.

In fabricated steel work the records of the Bridge Builders' and Structural Society show that in February bookings totaled 100,000 tons, against a theoretical capacity of 180,000 tons for all the shops of the country. Another large Government distribution is expected shortly for piers and warehouses at all important Atlantic coast ports. In portable hangars for France the week's awards have been put at 1400 and if the total should prove to be 4000 that would mean 100,000 tons of shapes.

Consumers are watching closely for evidences of competition bringing prices below the maximum figures agreed upon. It was known that on Government contracts for larger sized bolts and nuts, where many of one size were called for, cutting was general, and there has been some irregularity in bolt and nut prices on non-Government business. Cast-iron pipe prices also dropped under the official figures, and the deviations in the scrap trade have been common.

Chicago district works have taken heavy Government orders in the past week, the Emergency Fleet Corporation having placed 75,000 tons with one company, deliveries going about equally to fabricators and shipyards. The order is significant of the excellent progress being made on the shipbuilding program at Pacific Coast yards.

Steel production with some companies has made a considerable stride forward in the past week, Steel Corporation plants apparently coming closer to normal capacity than the majority of independent producers. A 10 per cent increase over the February rate represents the average condition. The situation as to cars and motive power is still a serious one and promises to continue so.

There are evidences, particularly in the East, that sales of iron and steel products from warehouse stocks are being made at higher prices than are provided for by the jobbers' allowance of 1c. and 1.25c. per lb. established by the general steel committee.

Pittsburgh

PITTSBURGH, March 19.—(*By Wire.*)

On the eve of the meeting of the Committee on Steel and Steel Products of the American Iron and Steel Institute with the War Industries Board at Washington, to be held Wednesday, March 20, the local steel trade is simply in a waiting attitude. It is understood the committee of the institute went to Washington fully impressed with the belief that no important changes in prices would be made at this time, with the possible exception that a reduction of $1 per ton in

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Mar. 20 1918	Mar. 13 1918	Feb. 20 1918	Mar. 21 1917
No. 2 X, Philadelphia...	$34.25	$34.25	$34.25	$39.00
No. 2, Valley furnace....	33.00	33.00	33.00	37.00
No. 2 Southern, Cincin...	35.90	35.90	35.90	32.90
No. 2, Birmingham, Ala.	33.00	33.00	33.00	30.00
No. 2, furnace, Chicago*	33.00	33.00	33.00	37.00
Basic, del'd, eastern Pa..	33.75	33.75	33.75	35.00
Basic, Valley furnace....	33.00	33.00	33.00	32.00
Bessemer, Pittsburgh ...	37.25	37.25	37.25	37.95
Malleable, Chicago*	33.50	33.50	33.50	37.00
Malleable, Valley	33.50	33.50	33.50	35.00
Gray forge, Pittsburgh..	32.75	32.75	32.75	32.95
L. S. charcoal, Chicago..	37.50	37.50	37.50	36.75
Billets, Rails, etc. Per Gross Ton:				
Bess. rails, heavy, at mill.	55.00	55.00	55.00	38.00
O.-h. rails, heavy, at mill.	57.00	57.00	57.00	40.00
Bess. billets, Pittsburgh..	47.50	47.50	47.50	65.00
O.-h. billets, Pittsburgh..	47.50	47.50	47.50	65.00
O.-h. sheet bars, Pittsb'gh.	51.00	51.00	51.00	65.00
Forging billets, base, P'gh.	60.00	60.00	60.00	90.00
O.-h. billets, Phila.....	50.50	50.50	50.50	65.00
Wire rods, Pittsburgh...	57.00	57.00	57.00	85.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia..	3.685	3.685	3.685	3.659
Iron bars, Pittsburgh....	3.50	3.50	3.50	3.50
Iron bars, Chicago.....	3.50	3.50	3.50	3.00
Steel bars, Pittsburgh...	2.90	2.90	2.90	3.75
Steel bars, New York...	3.095	3.095	3.095	3.919
Tank plates, Pittsburgh..	3.25	3.25	3.25	5.25
Tank plates, New York..	3.445	3.445	3.445	5.419
Beams, etc., Pittsburgh..	3.00	3.00	3.00	3.75
Beams, etc., New York..	3.195	3.195	3.195	3.919
Skelp, grooved steel, P'gh.	2.90	2.90	2.90	3.50
Skelp, sheared steel, P'gh.	3.25	3.25	3.25	3.75
Steel hoops, Pittsburgh..	3.50	3.50	3.50	4.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	1918 Mar. 20 Cents	1918 Mar. 13 Cents	1918 Feb. 20 Cents	1917 Mar. 21 Cents
Sheets, black, No. 28, P'gh.	5.00	5.00	5.00	5.00
Sheets, galv., No. 28, P'gh.	6.25	6.25	6.25	7.00
Wire nails, Pittsburgh...	3.50	3.50	3.50	3.20
Cut nails, Pittsburgh....	4.00	4.00	4.00	3.70
Fence wire, base, P'gh..	3.25	3.25	3.25	3.15
Barb wire, galv., P'gh...	4.35	4.35	4.35	4.05
Old Material: Per Gross Ton:				
Carwheels, Chicago	$30.00	$30.00	$30.00	$21.00
Carwheels, Philadelphia..	30.00	30.00	30.00	22.50
Heavy steel scrap, P'gh..	30.00	30.00	30.00	22.00
Heavy steel scrap, Phila..	29.00	29.00	30.00	24.00
Heavy steel scrap, Ch'go.	29.50	29.50	29.00	24.50
No. 1 cast, Pittsburgh...	30.00	30.00	30.00	21.00
No. 1 cast, Philadelphia..	30.00	30.00	30.00	23.00
No. 1 cast, Ch'go (net ton)	**27.50**	26.75	25.50	17.25
No. 1 RR. wrot, Phila...	35.00	35.00	35.00	32.00
No. 1 RR. wrot, Ch'go (net)	30.75	30.75	31.25	27.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt ...	$6.00	$6.00	$6.00	$8.50
Furnace coke, future	6.00	6.00	6.00	7.00
Foundry coke, prompt ...	7.00	7.00	7.00	10.50
Foundry coke, future ...	7.00	7.00	7.00	7.50
Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York.	23.50	23.50	23.50	36.00
Electrolytic copper, N. Y.	23.50	23.50	23.50	36.00
Spelter, St. Louis.....	7.50	7.50	7.75	10.37½
Spelter, New York.....	7.75	7.75	8.00	10.62½
Lead, St. Louis.....	7.10	7.10	6.85	9.37½
Lead, New York.....	7.25	7.25	7.00	9.50
Tin, New York	85.00	85.00	85.00	56.00
Antimony (Asiatic), N.Y.	13.25	13.25	13.50	32.00
Tin plate, 100-lb. box, P'gh	$7.75	$7.75	$7.75	$8.00

basic iron may be considered and adopted. If this reduction should be made it would put basic iron at $32 per gross ton at Valley furnace, and there would be the same differential of 10 per cent in favor of Bessemer iron, which would make the latter $35.20 Valley furnace, or a reduction of $1.10 per ton. A reduction of $1 in basic would be of help to Eastern plate mills that have been insisting on an advance in plates, as these mills buy their pig iron, which they would get at $1 per ton lower. However, what the War Industries Board may decide in regard to prices is purely surmise, and nothing definite will be known until the official announcement comes from Washington as to whether the board has reaffirmed prices or made some slight changes. There is also a possibility that prices on a few of the smaller manufactured steel articles may be readjusted, but there will be no general advances. The committee of the institute is strongly in favor of prices being fixed for the remainder of this year, instead of for second quarter only. With prices fixed for only three months, mills would not care to sell into third quarter, as they are pretty well sold up over second quarter, and there would not be much incentive for consumers to buy ahead. With prices fixed definitely for the remainder of this year, it would give the steel trade a stability that it does not now have, and the whole trade is very anxious that whatever action is agreed upon by the War Industries Board it shall govern prices for the remainder of this year.

Very little new buying is being done in pig iron, semi-finished steel or finished products. There is practically no pig iron or semi-finished steel to be bought in the open market, and finishing mills do not care to sell ahead until they know definitely what prices are to be in effect. Some weak spots have developed in the market, notably in wire products, nuts and bolts, and one or two other items of finished steel. The demand for these products has been very dull for some time. Makers are getting hard up for orders, and are more inclined to shade prices, if necessary to get new business.

The railroad situation is showing steady improvement, the operation of the tin plate mills on about 90 per cent being a result of this. It is believed the supply of cars will steadily increase from this time forward, and the building program of the Government, which includes 2500 locomotives and 150,000 new steel cars, gives promise that in a few months there will probably be an ample supply of motive power and cars as well. The feeling in the trade here is that the general demand for iron and steel during the summer months will not be very large, but the slack occasioned by this will probably be more than taken up by the increased demands of the Government, which promise to be much heavier in the second half of the year than in the first half.

Pig Iron.—All attention is focused on the action to be taken by the War Industries Board at its conference with the Committee on Steel and Steel Products of the American Iron and Steel Institute in Washington. There is an insistent inquiry for Bessemer and basic iron from nearly all steel concerns that have

not their own blast furnaces, but it is impossible to find it. Local consumers of Bessemer and basic iron will be very willing to buy it at any producing centers and pay the freight to Pittsburgh in order to get it, but cannot find it. Some sales of foundry and malleable iron are being made for delivery in the last half of this year, and most foundries working on Government contracts have pretty well covered their needs of foundry iron over the last half of this year. Output of pig iron is steadily increasing and at present the Carnegie Steel Co. is operating 46 out of 49 blast furnaces, the best record the company has made in blast furnace operation for some months. It expects to start three or four more furnaces in the near future. Consumers of all grades of pig iron are steadily importuning the furnaces for shipments, which are still greatly delayed by reason of the shortage in the supply of cars.

We quote as follows: Basic pig iron, $33; Bessemer, $36.30; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—The local market on semi-finished steel is extremely quiet, simply for the reason that there is no surplus steel on the market. Consumers are trying every means in their power to buy steel in this district, and at other steel-making places, but without finding it. A new open-hearth steel plant in the Warren (Ohio) district has made an exchange of ingots with a Youngstown mill for sheet bars. The scarcity in steel is likely to continue for some months, as no new capacity will come on the market for some time. Deliveries of sheet bars to the tin plate and sheet mills are slightly better, due to a larger supply of cars, but it is still necessary for sheet and tin mills that depend on the other producers for their supply to shut down for a day or two quite often, waiting for delayed steel to arrive.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $47.50, sheet bars $51, forging ingots $73, and forging billets $60 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Steel Rails.—We note a continued heavy demand for light rails from the lumber and coal interests, and the mills that are rolling new light rails and also the producers of rerolled rails are sold up for some months. Nothing is being done in standard sections. The Government price on light rails, rolled from billets, is $3 per 100 lb. for 25 to 45-lb. sections. There are no official prices on standard sections.

Ferroalloys.—There is still an active demand for ferromanganese and 50 per cent ferrosilicon for delivery over last half of this year. We note sales of 4000 to 5000 tons of 80 per cent domestic ferromanganese for delivery in last half of the year, at $250 per gross ton, delivered, and the market is firm at that price. There is an active demand for 50 per cent ferrosilicon, and prices are very firm. A consumer in the Wheeling (W. Va.) district is reported to have closed recently for 1000 to 1200 tons of spiegeleisen at about $65, delivered. We quote 80 per cent domestic ferromanganese at $250, delivered; 50 per cent ferrosilicon at $175 to $180, at furnace, and 18 to 22 per cent spiegeleisen at $65 to $70, delivered.

We now quote 9 per cent Bessemer ferrosilicon at $54, 10 per cent $55, 11 per cent $58.30, 12 per cent $61.60. We quote 6 per cent silvery iron $40, 7 per cent $42, 8 per cent $44.50, 9 per cent $47, 10 per cent $50. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of $2 per gross ton, for delivery in the Pittsburgh district.

Structural Material.—Nearly all the new work being placed is coming from the Government on direct or indirect orders, there being practically no new domestic work under way, owing to the high prices of steel and labor and the greatly delayed delivery. The McClintic-Marshall Co. has taken about 1500 tons for an explosive plant at Perryville, Md. The Thompson-Starrett Co. is receiving bids on 1200 tons of fabricated steel for a new boiler house at Charleston, W. Va. Mills report that deliveries on plain material intended for Government work are fairly satisfactory. Unless there should soon be an increase in new domestic work, some of the smaller steel fabricators will find themselves short of orders. We quote beams and channels up to 15 in. at 3c. at mill, Pittsburgh, and it is believed this price will be reaffirmed.

Plates.—It is not believed the War Industries Board will make any change in prices of plates at its meeting with the general institute committee at Washington. It seems almost certain that the Government would not advance price on plates at this time, in view of the enormous quantity it will take from the mills over the remainder of this year. It is possible that within a week or ten days Government inquiries for 2500 locomotives and 150,000 steel cars, the latter mostly 60 and 70-tons capacity, may come out. If this work is placed, it will come in good season for the car builders, as they have very little work ahead. For several months the Standard Steel Car Co. and the Pressed Steel Car Co. have been operating their plants mostly on Government contracts. No important inquiry is out for steel cars, aside from a few cars wanted by industrial concerns. It is the opinion of many that the Government price of 3.25c., Pittsburgh, on ¼-in. and heavier steel tank plates will be reaffirmed at Washington this week.

Tin Plates.—The mild weather is doing much to speed up operations and shipments of the tin plate mills, and at present the average rate of operations among the tin mills is very close to 90 per cent. If present favorable conditions continue, it may soon be larger. The car supply is much better, and shipments are heavier than for some months. Two or three solid trainloads of tin plates have recently been sent to the Pacific Coast, and also several to Baltimore, the latter being delayed considerably in delivery. The export demand for tin plate is fair, coming mostly from the Orient, and ranges in lots from 1000 to 1500 boxes up to 5000 boxes. However, permits are hard to secure, and very often are refused. Government officials have recently indicated their great satisfaction over the splendid way in which the tin plate interests have responded to the enormous demand for tin plate for food containers, and it is not likely that any agitation for the taking over of the tin plate industries by the Government would be warmly received. The demand for stock items of tin plate is active, brought about largely by shipments being held up, which have reduced stocks very much. We quote tin plate at $7.75 per base box, rolled from Bessemer and open-hearth steel. Prices on terne plate are given on page 777.

Iron and Steel Bars.—Mills report that the demand for all kinds of bars is good, some fairly large orders having lately been placed by the implement trade, and jobbers have also been buying freely. The Government demand for steel bars, both direct and indirect, is also quite heavy. One consumer is in the market for 1600 tons to be used in the building of coal mine cars, and a local nut and bolt concern has placed 1100 tons for second-quarter delivery. The demand for iron bars is also active, and mills rolling both iron and steel bars are well sold up to third quarter, while two of the largest makers have their output under contract over third quarter or later. We quote steel bars rolled from old steel rails at 3c. from steel billets, 2.90c., and refined iron bars, 3.50c., in carloads, f.o.b. Pittsburgh.

Wire Rods.—The inquiry is not as active as some time ago, this reflecting the dull trade in wire nails. There is some export demand for rods from the Orient, South America and heavy demand from Canada. The inquiry for high-carbon rods is also large. Two local rod makers say they are not actively seeking new orders for soft rods, but are diverting steel to other products, on which the profit is larger. Prices on rods are given in detail on page 777.

Wire Products.—Bids have gone in from nearly all the mills on the 30,000 kegs of wire nails wanted by the Army through the general engineer department for shipment to France. While the Government asked for competitive bids on this business, local makers of wire nails say they will not quote less than $3.50 and may

quote $3.60, the extra 10c. being to cover the expense of lining the kegs with paper and putting steel cleets across both ends of the kegs. While the new demand for wire and wire nails is quiet, local makers say they are not in distress for new orders; in fact, they recently refused other business, not being able to make the deliveries wanted. None of the wire mills is operating on an average of over 50 per cent, but some are running at a less rate. The general demand is dull, and the outlook is that the wire and wire nail trade in the summer months will be quiet. It is stated that no concessions from the regular prices are yet being named by any of the mills. The Government prices on wire and wire nails, in effect until March 31, are given on page 777.

Cold-Rolled Strip Steel.—Mills continue to report that the demand is very dull, but the Government is buying a fairly large quantity of cold-rolled strip steel for work in this country and for shipment to France. It is said that the output of cold-rolled strip steel at present is not over 50 per cent of capacity.

We quote cold-rolled strip steel at $6.50 per 100 lb., f.o.b. Pittsburgh, terms 30 days, less 2 per cent cash in 10 days, when sold in quantities of 300 lb. or more.

Sheets.—There is a fair demand for sheets from the general trade, but most consumers are covered for five or six months, and some of the larger steel mills have obligations that will take their entire output to July or August. The Government continues to be a very heavy buyer of sheets. Owing to the loss in output during the railroad congestion and the cold weather, the mills got far behind in deliveries. Some sheet mills that figured early in the year they were sold up for three or four months now find they will have very few sheets to spare before third quarter. As noted in our report last week would be the case, sheet mill hand wages for March and April will be 4½ per cent less than for the two previous months. Leading sheet makers do not expect prices will be changed at the conference with the War Industries Board to be held in Washington on Wednesday. Heavy stocks piled in warehouses during the extreme railroad congestion and cold weather are now moving out quite freely, due to the better car supply. Prices will be found on page 777.

Hot-Rolled Strip Steel.—The new demand is dull, due to the indifferent operations of the mills making cold-rolled strip steel. The Government price on hot rolled strip steel is $4.50 per 100 lbs., f.o.b. Pittsburgh, but it is claimed this price is not firmly held.

Nuts and Bolts.—The Government is placing a fair amount of new business in nuts and bolts in direct and indirect orders, but not nearly so heavy as some time ago. The general demand is quiet, and has been for some months. None of the makers of nuts and bolts is operating to more than 75 per cent of capacity, if that great, due to the falling off in orders and scarcity of steel.

Rivets.—No large orders for rivets have come from the Government recently, and the demand from the general trade is very dull. Makers accumulated heavy stocks during the railroad congestion and the cold weather, but these are moving out more freely, due to the better car supply. Government prices in effect until March 31 on structural rivets are $4.65 on cone-head boiler rivets and $4.75 per 100 pounds, f.o.b. Pittsburgh.

Spikes.—The demand is dull, and makers do not look for any large business from the railroads for some months. The Western Maryland has placed about 3000 kegs with a local maker. The demand for small spikes is very heavy, and all the makers are sold up for four or five months. Prices in effect until March 31 are as follows:

Standard sizes of railroad spikes, 9/16 x 4½ in. and larger, $3.. 0 per 100 lb. in lots of 200 kegs of 200 lb. each, or in larger lots. Boat spikes, $5.25 per 100 lb.; track bolts, $4.90 base in lots of 200 kegs or more; less than 200 keg lots, $1 per 100 lb. extra. All f.o.b. Pittsburgh.

Shafting.—The current demand is dull, and orders from the Government are not nearly so heavy as some time ago. It is said output of shafting at present is not over 60 per cent of capacity, and perhaps less. It is claimed discounts are being firmly held. We quote cold-rolled shafting at 17 per cent off list in carloads and 12 per cent in less than carloads, f.o.b. Pittsburgh.

Wrought Pipe.—Effective March 15, freight rates on iron and steel pipe to the Pacific Coast were advanced, and as a result the National Tube Co. has issued three new price lists on oil country goods sold in California, the new prices being for delivery to Pacific Coast points. It is probable other makers of oil country goods that sell for delivery to the Coast will also issue new prices, to conform to the new freight rates. Nearly all the mills making iron and steel pipe have their output sold up for practically all of this year, and they are compelled to turn down projects being put up to them by large gas and oil interests, which, if they could take care of, would require very large quantities of line pipe. The high prices ruling on oil are causing a good deal of new development work, but the oil producers are having much trouble in finding any mills that will agree to take on lines for this year's delivery that involve very much pipe. The Government is still buying fair-sized quantities of iron and steel pipe, but has not placed any very large orders for some time. The pressure on the mills for delivery of oil country goods is heavy, and all the mills are very much behind in shipments. The demand for butt-weld sizes of iron and steel pipe is only fair, and some mills can ship out in from eight to 10 weeks from date of order. Discounts on iron and steel pipe, effective to March 31, which it is not believed will be changed, are given on page 777.

Boiler Tubes.—Practically the entire output of iron and steel tubes for this year is under contract, probably 75 per cent of it to go to the Government on direct or indirect orders. Several of the larger makers of steel boiler tubes, and also of seamless steel tubes, have obligations on their books that will take their entire output from now until well into the middle of next year. It is expected that the output of tubes this month will be the heaviest in any one month for some time, but all the mills are far back in deliveries, and it will take them some months to catch up. Discounts on iron and steel tubes in effect until March 31 are given on page 777.

Coke.—The car supply in the coke regions is showing steady improvement. Early last week it was very close to 100 per cent for several days, but fell off greatly in the latter part of the week, the average having been between 50 and 60 per cent. The car supply is not yet large enough to allow any free coke to be made, and as a result only a few cars of furnace coke are sold now and then, and at regular prices. The supply of labor is reported good, but probably would be short if the coke plants had a full supply of cars and were able to operate nearly to capacity. Coke producers do not believe the Government will make any change in prices on any grades of coke, but expect them to be re-affirmed. The Connellsville *Courier* gives the output of coke in the Upper and Lower Connellsville regions for the week ending March 9 as 314,409 tons, an increase over the previous week of 28,581 tons. This is the largest output of coke in the Connellsville regions for about six months. We quote 48-hr. blast furnace coke at $6, 72-hr. foundry coke at $7, and crushed coke from 1-in. size at $7.30, all per net ton at oven.

Old Material.—The Pennsylvania Railroad recently sold upward of 10,000 tons of steel scrap direct to various consumers and at full Government prices, but so far as dealers are concerned the local scrap market is almost at a standstill, there being no incentive on the part of dealers to try to sell scrap until a decision is handed down by the committee as to whether dealers are to be allowed a commission of 3½ per cent per gross ton when they sell scrap direct to consumers. A definite decision in this matter is looked for very soon, but until it is made dealers say they will simply hold off. Permits for cars are a little easier to obtain, but the great trouble is to find any scrap available. There is no encouragement for dealers to pile scrap in their yards until they know they can make some profit on it, and the supply of scrap among consumers is running very short. Dealers still feel that the scrap committee should fix prices on all grades of scrap f.o.b. cars at

shipping point, as they think this would help the market decidedly, especially under present conditions. It often happens that there is a scarcity of scrap in one place, while it could be obtained in another. If prices were made f.o.b. at shipping point, it would allow dealers to bring scrap from one place to another and do business, but under the present plan of all prices at consuming points it is impossible. A few small lots of scrap are being sold by dealers to consumers, but the movement is light. No doubt the decision about commissions will be made before this month ends, possibly at the conference in Washington on Wednesday, March 20, between the General Committee on Steel and Steel Products and the War Industries Board. Dealers hope the decision may be in their favor.

Prices on iron and steel scrap, nearly all of which have been fixed by the Government, for delivery in Pittsburgh and other points that take Pittsburgh freights, are as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$30.00
No. 1 foundry cast	30.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., Franklin, Pa., and Pittsburgh	35.00
Hydraulic compressed sheet scrap	$26.00 to 27.00
Bundled sheet scrap, slides and ends f.o.b. consumers' mill, Pittsburgh district	24.00 to 25.00
Bundled sheet stamping scrap	22.00 to 23.00
No. 1 railroad malleable stock	30.00
Railroad grate bars	19.00 to 20.00
Low phosphorus melting stock	40.00
Iron car axles	47.50
Steel car axles	47.50
Locomotive axles, steel	47.50
No. 1 busheling scrap	27.00 to 28.00
Machine shop turnings	20.00
Cast iron wheels	30.00
Rolled steel wheels	35.00 to 37.00
*Sheet bar crop ends	39.00 to 40.00
Cast iron borings	20.00
No. 1 railroad wrought scrap	35.00
Heavy steel axle turnings	25.00
Heavy breakable cast scrap	30.00

*Shipping point.

Chicago

CHICAGO, March 19—(*By Wire*).

Government demands have been exceedingly heavy, the week bringing a greater influx of orders to the leading interest than at any time heretofore. With this company the Emergency Fleet Corporation alone placed orders aggregating about 75,000 tons of ship material, delivery to be about equally divided between fabricators and shipyards, not a little going to the Pacific coast, where excellent progress is now being made in shipbuilding. The principal local independent, though already well filled with orders for ship material, booked an order for 6500 tons of plates for Pacific coast delivery. Meanwhile steel production is close to capacity. At Gary 12 stacks are now in blast, a new one being blown in last week, making the largest blast furnace plant in the world. Twelve furnaces stand in one row. Early this week 42 open hearths were operated at Gary. The Illinois Steel Co. has 25 out of 29 blast furnaces running. The Inland Steel Co. is doing well.

The scarcity of pig iron is becoming more acute, and all the producers have waiting lists of those who want to commit themselves to take iron. Malleable and Bessemer are especially scarce.

The general opinion of the trade with regard to prices is that it would be better to leave them where they are and extend their effectiveness until the end of the year. Rerolling rails are so scarce that one bar mill has been forced to shut down. An Eastern producer is offering bars rolled of discard shell steel to implement makers, while a local mill is also offering bars rolled from similar stock.

Pig Iron.—Actual business is at a standstill, despite a widespread demand. The Northern makers are practically out of the market for all deliveries for the remainder of the year, and the Southern furnaces have withdrawn all offerings except in the case of one company not recently a factor. The makers of charcoal iron are not quoting, and of Bessemer and malleable there is almost a famine. The Sheffield Coal & Iron Co., which has repaired its plant at Sheffield and improved its iron and coal mines and coke ovens, announces that it expects to be operating about April 10, and after that time can offer iron ranging in silicon from 1.75 to 3.25 per cent. There is every indication of a general scarcity in iron that promises to become acute. Local interests have received inquiry from sections as remote as Vermont, but these, like the inquiries from nearer home, are turned down. A seller of Southern has inquiries aggregating 25,000 tons awaiting attention. It is noticeable that those inquiring state they will accept the nearest possible analysis to that they specify; also, if they cannot have the full quantity, part of it would be acceptable. For some time the smaller Southern furnaces have been taking no last-half business, because of the uncertainty of their coke supply. One of the two Suwanee furnaces at Grand Rivers, Ky., has been banked because of the shortage of coke, this having occurred several times. Only one furnace has been running, but it is expected that the other will be blown in soon. Most of the smaller Southern furnaces would like to see prices higher, as their margin of profit is not great at $33 furnace. Steel works which buy iron, also cast-iron pipe makers, on the other hand, are anxious that the price should be reduced. As for the scarcity of iron, insufficient coke and faulty transportation of what there is are held accountable for the situation. The prevailing opinion is that it would be best for existing prices to be extended throughout the remainder of the year, action which would have a wholesome effect on the trade. As to what will be done there is only conjecture. As for shipments, it is believed that mild weather will cause continued improvement.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	$37.50
Lake Superior charcoal, No. 6 and Scotch	40.00
Northern coke foundry, No. 1	33.50
Northern coke foundry, No. 2	33.00
Northern coke foundry, No. 3	32.50
Northern high-phosphorus foundry	33.00
Southern coke No. 1 foundry and No. 1 soft	38.50
Southern coke No. 2 foundry	37.00
Malleable	33.50
Basic	33.00
Low phosphorus (copper free)	53.00
Silvery, 7 per cent	44.54

Ferroalloys.—There has been considerable offering of spiegeleisen for last half delivery at about $70, delivered, and the closing of several transactions is pending. Eighty per cent ferromanganese continues firm at $250, delivered.

Structural Shapes.—The Government is absorbing nearly all the shapes which are rolled, but some scattered business of commonplace nature is reported. The Pacific Rolling Mill Co. will supply 550 tons of steel for a boiler shop at Oakland, Cal., for the Moore & Scott Iron Works. The Virginia Bridge & Iron Co. will fabricate 189 tons for filter and kiln houses at Reserve, La., for the Leon Godchaux Co., Ltd. The American Bridge Co. will supply 365 tons for five turntables for the C. B. & Q. Railroad, and the Ralston Iron Works will fabricate a viaduct requiring 103 tons for San Francisco. The mill quotation is 3c., and jobbers ask for material out of warehouse 4.20c.

Rails and Track Supplies.—Government buying is awaited. We quote:

Standard railroad spikes, 4.11½c., Chicago. Track bolts, with square nuts, 5.11½c., Chicago. Tie plates, steel, 3.25c.; tie plates, iron, 3.75c., f.o.b. maker's mill. The base for light rails is 3c., f.o.b. maker's mill for 25 to 45-lb. sections, lighter sections taking Government extras.

Plates.—There is little to say except that Government business dominates this product. In the past week the Emergency Fleet Corporation placed with the leading interest about 75,000 tons of ship material, about half of which is to be delivered to fabricators and about half to shipyards. Deliveries beginning at an early date are wanted. The leading independent took 6500 tons of plates for delivery to the Pacific Coast for the Emergency Fleet Corporation. It is pointed out that the demand from the Pacific is growing heavier and it

is considered not unlikely that some of the eastern mills will have to help out. The mill quotation is 3.25c., Chicago, and that of jobbers for plates out of stock is 4.45c.

Bars.—Concrete reinforcing bars have been active, but the makers are in a difficult position because of the inadequate supply of rerolling rails. One mill which exhausted its supply of rails last week was obliged to shut down. Bars rolled from discarded shell steel are being sold for concrete reinforcing and also offered to the agricultural implement industry. The demand for common bar iron is fair and local makers are getting their share of business. Few mild steel bars are being sold by some mills, although the leading interest is caring for its customers. We quote mild steel bars at 2.90c., Chicago; bar iron at 3.50c., Chicago, and rail carbon bars at 3c., Chicago. Jobbers quote:

Soft steel bars, 4.10c.; bar iron, 4.10c.; reinforcing bars, 4.10c., base, with 5c. extra for twisting sizes ½ in. and over and usual card extras for smaller sizes; shafting, list plus 10 per cent.

Wire Products.—A curious situation exists, especially in respect to nails. Several weeks' production was seriously curtailed by the lack of steel or coal, large mills being completely down during the storm periods. It is only very recently that transportation began to show any improvement, and the mills still have the utmost difficulty to obtain cars in which to ship the accumulation of manufactured product. Lately they have been using cattle cars when they could obtain them. Some of the jobbers whose stocks have become depleted accept the conditions described as the causes of their predicament, while others seem to believe the real cause to be that the wire mills have been turning their attention to products more profitable than nails. Another phase of the situation is that while demand has fallen off in some directions, the loss has more than been made up in others. Farmers plan to put more land under cultivation and want more fencing than they used last year, except in some of the Northwestern States where crops were failures. Barbed wire is certain to be scarce, partly because of the large quantities which are being exported. Country work is more active than city work, and nails are much in demand for repair work everywhere. We quote:

Nails, $3.50, Pittsburgh; plain fence wire, $3.25; painted barb wire, $3.65; galvanized barb wire, $4.35; polished staples, $3.65, and galvanized staples, $4.35.

Sheets.—Business has been almost entirely confined to orders which indirectly emanate from the Government. The mills have all the orders they can care for, and are trying not to sell. On the average, they are running about 60 per cent of capacity, and do not find it easy to get sheet bars to keep busy at this rate, as tin plate is taking much of the steel which ordinarily would go into sheets. The leading interest recently announced that it would care for its customers to the best of its ability in the second quarter, but could not promise definite deliveries. We quote No. 10 blue annealed sheets at 4.25c., No. 28 black at 5c. and No. 28 galvanized at 6.25c., all Pittsburgh.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 5.45c.; No. 28 black, 6.45c., and No. 28 galvanized, 7.70c.

Bolts and Nuts.—The call has been lighter in the past few days, presumably because of an inclination to await the announcement of second quarter prices. The Government inquiry for 55,000,000 bolts issued at Jeffersonville, Ind., is pending. Prices on regular lines of bolts are fairly level, but there has been some cutting on bids taken at Washington, especially on one very desirable order for 12,000,000 bolts. Eastern manufacturers made the lowest prices. For prices and freight rates see finished iron and steel, f.o.b. Pittsburgh, page 777. Jobbers quote:

Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅞ x 4 in., 40 and 10 per cent off; larger sizes, 35 and 5 off; carriage bolts up to ⅞ x 6 in., 40 and 2½ off; larger sizes, 30 and 5 off; hot pressed nuts, square tapped, $1.05 off, and hexagon tapped, 85c. off per 100 lb.; coach or lag screws, gimlet points, square heads, 50 per cent off.

Old Material.—There has been something done in cast and rolling mill grades but the market generally has been quiet with not much material offered. The steel mills are holding off until the end of the month before buying in view of the possibility of price changes. While most of the trade would like to see prices remain where they are, there are some who admit that present levels tend, in some instances, to the disadvantage of the Pittsburgh district. The question of a commission to brokers is still in abeyance and is expected to remain there until the question of prices is out of the way. The trade's deliveries to the East have been hard hit by an embargo imposed March 11 on all shipments of iron, steel and scrap to points East of the Illinois-Indiana line. An urgent appeal for the shipment of 25 cars to western Pennsylvania elicited the reply that no exceptions were made unless a license was had from Washington. The order does not apply to war shipments. It was issued by the Regional Director of Railroads, R. H. Aishton. The Santa Fe has issued a small list and the C. & A. one of fair size.

We quote for delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Old iron rails	$39.00 to	$40.00
Relaying rails		60.00
Old carwheels		30.00
Old steel rails, rerolling		35.00
Old steel rails, less than 3 ft.		35.00
Heavy melting steel		30.00
Frogs, switches and guards, cut apart		30.00
Shoveling steel	29.50 to	30.00
Steel axle turnings		25.00
	Per Net Ton	
Iron angles and splice bars		$35.71
Iron arch bars and transoms	$39.00 to	40.00
Steel angle bars	30.00 to	31.00
Iron car axles		42.41
Steel car axles		42.41
No. 1 railroad wrought	30.75 to	31.25
No. 2 railroad wrought		30.36
Cut forge		30.36
Pipes and flues	24.50 to	25.00
No. 1 busheling	26.50 to	27.00
No. 2 busheling	18.25 to	18.75
Steel knuckles and couplers		31.25
Coil springs		31.25
No. 1 boilers, cut to sheets and rings	22.00 to	23.00
Boiler punchings	32.00 to	33.00
Locomotive tires, smooth	38.50 to	39.50
Machine-shop turnings	16.50 to	17.00
Cast borings	16.75 to	17.25
No. 1 cast scrap	27.50 to	28.50
Stove plate and light cast scrap	23.00 to	23.50
Grate bars	22.50 to	23.50
Brake shoes	25.00 to	26.00
Railroad malleable	28.25 to	28.75
Agricultural malleable	27.25 to	27.75
Country mixed scrap	20.00 to	22.50

Cast Iron Pipe.—Business is dull. Fort Wayne, Ind., was scheduled yesterday to let between 200 and 300 tons and on March 26 Battle Creek, Mich., will let 100 to 300 tons. Saginaw, Mich., has placed 135 tons with the Massillon Iron & Steel Co. We quote:

Quotations per net ton, Chicago, are as follows: Water pipe, 4-in., $57.30; 6-in. and larger, $54.30, with $1 extra for Class A water pipe and gas pipe.

Cleveland

CLEVELAND, March 18—(*By Wire*).

Iron Ore.—Ore prices will be taken up at the price conference of the steel manufacturers and War Industries Board in Washington Wednesday. The ore men will not ask that prices be advanced a stated amount, but merely present data in support of their claim that they should be allowed higher prices. Some consumers are deferring buying ore until the price question is disposed of and it is expected that the market, which is now very dull, will take on more life as soon as the results of the Washington conference are known. Dock shipments show some improvement. We quote f.o.b. lower lake ports:

Old range Bessemer, $5.95; old range non-Bessemer, $5.20; Mesaba Bessemer, $5.70; Mesaba non-Bessemer, $5.05.

Pig Iron.—Inquiry for pig iron continues plentiful, and the scarcity is becoming more acute. One Cleveland seller is still taking orders for foundry iron from its regular trade, but many northern Ohio foundries have not covered for their last half requirements. Some of the producers believe that it will be necessary for the Government to commandeer iron needed for Government work. A Cleveland company is inquiring for 2000 tons of Bessemer iron, and there is an inquiry for 2000 tons of Bessemer for export to Italy. The Government is asking for 300 tons of foundry iron for export to France for the French Engineers' Department, and 300 tons for an Iowa plant. No new basic inquiries are reported and inquiries from several Ohio consumers

previously noted are still unsatisfied. We note the sale of 500 tons of Northern and 500 tons of Southern foundry iron to a Cleveland foundry for the last half. Several sales of small lots of low-silicon Southern iron are reported in Cleveland, and one producer who has been active in the territory has withdrawn from the market, being sold up for the last half. We quote f.o.b. Cleveland as follows:

Bessemer	$37.25
Basic	33.30
Northern No. 2 foundry	33.30
Southern No. 2 foundry	37.00
Gray forge	32.30
Ohio silvery, 8 per cent silicon	46.12
Standard low phosphorus, Valley furnace	50.00

Finished Iron and Steel.—There is demand for plates in small lots, but as a whole the market is not very active. Many consumers are apparently deferring purchases until action is taken on second quarter prices. The car situation continues very bad and mills are unable to get cars to move shipments as fast as the material is produced. The situation in respect to box cars is much worse than in respect to open cars and this is affecting particularly shipments of the largest Valley producer, which has more than half of its mills shut down because cars are not available. Plate consumers are having trouble in securing steel unless they have Class A priority orders. Small shapes for tank cars and other industrial work are in good demand and scarce, and some orders are being placed for delivery from Eastern warehouses. There is considerable inquiry for sheet bars and for shell discard for rerolling hard steel bars. Some sheet bar tonnage will be placed on the market when the price question is disposed of. Good progress is being made by lake shipyards in shipbuilding for the Emergency Fleet Corporation. With the completion of new berths and without delays for material the American Shipbuilding Co. will soon have a capacity for turning out a 260-ft. ocean boat every three and a quarter days. The falling off in building work has caused a sharp decline in the demand for steel used for buildings outside of structural frames, and some tonnage ordered for this work is being canceled. There is very fair inquiry for alloy steel, for axles, rim sections and steel for other motor truck parts. With the approach of spring the demand for spikes is improving and some mills that have been able to make shipments from stock are now six to eight weeks behind on deliveries. The demand for blue annealed and galvanized sheets continues heavy and one Valley interest that has been making sales subject to cancellation by the buyer or seller should second-quarter prices be unsatisfactory to either has taken such a large tonnage that it has withdrawn from the market.

We quote warehouse prices as follows: Steel bars, 4.03½c.; plates, 4.38½c.; structural material, 4.13½c.; No. 10 blue annealed sheets, 5.35c.; No. 28 black sheets, 6.35c.; No. 28 galvanized sheets, 7.60c.

Coke.—Although shipments from the Connellsville district have improved materially, foundries are crowding producers for coke. Some consumers have a supply for their immediate needs, but are anxious to accumulate some surplus. Considerable tonnage is being cancelled on contracts by some of the producers who are cancelling at the end of each month all coke that they have been unable to ship during that month.

Bolts, Nuts and Rivets.—The demand for bolts and nuts, outside of Government requirements, shows an improvement over last month, a better volume of orders coming from the implement trade and manufacturers in some other lines. New Government inquiries include two lots aggregating 4,000,000 to 5,000,000 bolts and nuts. While there has been some price shading recently on both Government and commercial business amounting to 2½ to 5 per cent, and in some cases a little more, it is claimed that no concessions are being made by the larger bolt manufacturers. The volume of rivet specifications continues heavy.

Old Material.—Low-phosphorus scrap is active, but other grades are rather quiet. Some dealers are including in their contracts a rider stipulating that should the Government authorize the charging of commissions, the commission is to be added to the price paid by the buyer. Dealers could sell round tonnages of heavy melting steel scrap were they able to secure this grade, which continues very scarce. The $5 a ton advance made by the Government on cast iron scrap broken to cupola sizes has resulted in a sharp advance in stove plate, which is being substituted for cast scrap because of its lower price, and as high as $25.50 is being offered for this grade. Grate bars are also higher. Foundries are still refusing to pay the Government maximum for cast iron scrap, but $33.75 is being offered for this grade. Some new busheling has been sold at $32 gross, but the market is still somewhat below that price, which is the Government maximum. Sales of busheling to dealers are reported at $27.50 to $27.75, net, or a little under $31 gross. Hydraulic compressed steel scrap is slightly easier. Dealers quote, f.o.b. Cleveland, as follows:

	Per Gross Ton	
Steel rails	$27.00 to	$28.00
Steel rails, rerolling		35.00
Steel rails, under 3 ft.		35.50
Iron rails		40.00
Iron car axles		47.50
Steel car axles		47.50
Heavy melting steel		30.00
Cast borings		20.00
Iron and steel turnings		20.00
No. 1 railroad wrought		35.00
Hydraulic compressed steel scrap	28.00 to	29.00
Cast iron carwheels, unbroken		30.00
Cast iron carwheels, broken		35.00
Agricultural malleable	24.00 to	25.00
Railroad malleable		35.00
Steel axle turnings		25.00
Light bundled sheet scrap	24.50 to	25.00
Cast iron scrap		30.00
Cast iron scrap, broken to cupola sizes	34.00 to	35.00
No. 1 busheling	31.00 to	32.00
Per Net Ton		
Railroad grate bars	23.00 to	24.00
Stove plate	25.00 to	25.50

Cincinnati

CINCINNATI, March 19—(*By Wire*).

Pig Iron.—The probability of a readjustment of prices on April 1 retarded buying on the part of some foundries and it has been only within the past few days that they realized the necessity of providing further for their future requirements. Basic melters were in some respects negligent in providing for future needs, but this is somewhat excusable because of the urgent demand for their products requiring more iron than was estimated. A nearby mill recently purchased some Southern iron, and another southern Ohio user also bought a limited tonnage for last half shipment. Right now there seems to be an urgent demand for any basic iron that can be shipped in the first half. Inquiries are also out for more last half iron, but it is difficult to say where this iron can be bought. In the South the supply is running short, and furnace equipment there for making basic is by no means sufficient to take care of present needs. Furnaces in southern Ohio are sold up on foundry, basic and malleable. Southern foundry iron that has been sold so freely for last half delivery is still to be had, but makers are holding back in letting go the comparatively small tonnage that can be sold. The low-grade iron in the South produced within the past six months is being disposed of more rapidly, and furnace yards are comparatively clean. Shipments from the South are moving in much better shape, but there is a scarcity of cars that is now causing considerable uneasiness. The Virginia furnaces are said to be unable to take on any new business outside of their own territory.

Based on freight rates of $2.90 from Birmingham and $1.26 Ironton, we quote f.o.b. Cincinnati, as follows:

Southern coke, No. 2 foundry and No. 2 soft	$35.90
Southern Ohio, No. 2	34.26
Basic, Northern	34.26

Finished Material.—Orders are coming in at such a rate that jobbers are unable to fill them promptly. Embargoes on shipments to nearly all nearby points have been raised, but there is still considerable trouble in sending forward less than carload shipments. The principal reason that the jobbers are so far behind is due to the fact that they were unable to forward shipments over a period of nearly two months. New orders accumulated and shipments on old contracts were in some cases impossible to make. Coupled with this was the receipt of shipments from the mills that had to be

unloaded and assorted, and in the case of structural material a large part of it had to be fabricated. The mill supply houses report an increasing demand from the machine shops. The high speed steel business continues good and a number of manufacturers are adhering to the Government's price of $2 per lb. base. Wire nails are moving quite freely, but in some cases the warehouses claim that less than carload shipments are difficult to make to certain Indiana and Ohio points.

Jobbers' prices are unchanged as follows: Iron and steel bar, 4.08½c.; twisted bars, ¾ x 1¼-in., 4.23½c.; ⅜-in., 4.33½c.; ½-in., 4.43½c.; ⅝-in., 4.63½c., and ¼-in., 4.88½c. Structural shapes are quoted at 4.18½c.; plates, ¼-in. and heavier, 4.43½c.; No. 10 blue annealed sheets, 5.43½c. Cold rolled shafting is sold at 10 per cent discount. The mill price on No. 28 black sheets is 5.18½c., and No. 28 galvanized 6.43½c. Wire nails, $4.10 per keg, base.

Coke.—Frequent complaints are made as to the non-delivery of both furnace and foundry coke. Consumers' stocks are very light and, while an improvement in the labor situation is reported one week, it is offset the next by a shortage in cars. The situation is such that sellers cannot take on any new business. In many instances, it has been necessary to curtail shipments on contracts so as to distribute the fuel in an equitable manner. No further changes have been made since the advance of Pocahontas furnace or foundry coke to $8 per net ton at oven.

Fluorspar.—Prices are very irregular, and washed gravel fluorspar for spot shipment is quoted all the way from $35 to $40 per net ton at shipping point. It is also said that lower than the minimum figure named can be done. For future shipment, some contracts have been made as low as $28, although $30 represents the average quotation on contracts for the remainder of the year. Deliveries are still somewhat slow, as shipments were cut off on account of the cold weather, approximately from the first week in December to Feb. 10. The car shortage is also reported as being a retarding influence in catching up with delayed shipments.

Old Material.—Considerable improvement is noted in the outside movement of scrap iron, but it is not by any means normal. The absence of new business is construed in a measure to the uncertainty as to what, if any, changes will be made in Government prices this week. Some grades of scrap will undoubtedly be in short supply very soon after the interrupted shipments begin to the larger consuming districts. The following are dealers' prices, f.o.b. at yards, southern Ohio and Cincinnati:

Per Gross Ton

Bundled sheet scrap	$19.00
Old iron rails	$32.00 to 32.50
Relaying rails, 50 lb. and up	44.00 to 44.50
Rerolling steel rails	33.00 to 33.50
Heavy melting steel scrap	27.00
Steel rails for melting	27.00 to 27.50
Old carwheels	28.00

Per Net Ton

No. 1 railroad wrought	$29.00 to $29.50
Cast borings	14.50 to 15.00
Steel turnings	14.50 to 15.00
Railroad cast	25.00 to 25.50
No. 1 machinery	25.00 to 25.50
Burnt scrap	16.50 to 17.00
Iron axles	40.00 to 40.50
Locomotive tires (smooth inside)	33.50 to 34.00
Pipes and flues	19.00 to 19.50
Malleable cast	24.00 to 24.50
Railroad tank and sheet	17.00 to 17.50

Birmingham

BIRMINGHAM, ALA., March 18.

Pig Iron.—Iron buyers are trying hard to make manufacturers sell for last-half delivery, while the makers are slow in filling for that period beyond the considerable quantity already sold. The largest foundry producer is out of the market except on one grade, another is conserving for its own possible steel-making needs, and none seeks the market. General expectation is that little, if any, change in prices will be made by the Government April 1. Manufacturers have protected themselves against low prices by cancellation clauses inserted in contracts for delivery after April 1. The principal effort of furnace operators continues to be to secure adequate raw material on time. Improvement in the labor situation aids in this matter and production ought to increase, in fact, has improved during the past fortnight. Shipping difficulties have led to considerable accumulations on yards. Warrants are so small as not to count, stocks consisting mostly of free foundry and basic. The 1918 production is already 50,000 tons under that for the same period in 1917. By June, with good weather and an easing in labor disputes, the output ought to be greatest in the history of the State, as the Sheffield furnaces of the Sheffield Coal & Iron Co. and Trussville stack are slated to blow in at an early date. That water and sanitary pipe plants and some machine shops are consuming less pig iron locally is of no consequence to iron makers in the light of the general demand. The only problem in the Southern field is in raw material supply, which, in turn, depends upon the attitude of labor, which cannot be foreseen long at a time. Pig iron is quoted per gross ton, f.o.b. Birmingham, $33.

Coal and Coke.—There are no strikes in the coal field, the most recent trouble being under Government consideration, but high wages continue to have the apparent effect of reducing working hours. Many large mines are operating on a schedule of three days per week. Coke is not as scarce as it has been, but operators are in no hurry to take on new business until they see more steadiness of operations. Movements are easier than they have been, the car service improving steadily since spring opened.

Cast-Iron Pipe.—The large plant of the United States Cast-Iron Pipe & Foundry Co., at Bessemer remains closed down, but the Dimmick, National and American, in Birmingham, are running. There has been a considerable movement of water pipe to the Pacific coast. Sanitary pipe for building purposes generally is more than dull, but Government works call constantly for considerable supplies from this district and keep the majority of plants in operation.

Old Material.—Scrap is moving with greater freedom than in some time. The market is characterized by steadiness, demand and supply keeping somewhat the same pace. For this reason there is little disposition to change the price list. We quote per gross ton, f.o.b. Birmingham, as follows:

Old steel axles	$32.00 to $33.00
Old steel rails	28.00 to 30.00
Heavy melting steel	25.00 to 27.00
No. 1 R. R. wrought	27.00 to 30.00
No. 1 cast	25.00 to 26.00
Old carwheels	25.00 to 30.00
Tramcar wheels	21.00 to 25.00
Machine shop turnings	17.50 to 19.00
Cast iron borings	13.00 to 15.00
Stove plate	19.00 to 21.00

St. Louis

ST. LOUIS, March 18.

Pig Iron.—With representatives of the furnaces having little material to sell, the week was a dull one so far as transactions went, but many inquiries came out from consumers who were looking for anything obtainable from spot shipment to any delivery on through the rest of the year. Sales during the past fortnight have aggregated probably 7500 tons, aside from basic, most of the foundry iron having been taken by stove foundries and similar industries for delivery in the last half. The inquiry for 10,000 tons of basic has been filled, having been divided up among several sources of supply. Another inquiry for 40,000 tons of basic for last half delivery is now pending and furnace representatives are doing their best to find furnaces which will take on the business. It is expected that the transaction will be pretty well split up when finally closed. A troublesome feature for the market is the imposition of an embargo on iron shipments east from St. Louis beyond the Indiana Illinois line, though Chicago is still open, relieving the pressure somewhat.

Coke.—No transactions in coke are possible because nothing is available to the local representatives of ovens except for some small quantities of crushed coke for domestic use. Deliveries of contract coke are still interrupted and in this market, as in pig iron, the chief duties of representatives are to act as traffic men to trace shipments. No by-product coke is available, nor is there likely to be any for some time.

Finished Iron and Steel.—Urgent call for material under contract constitutes about the only feature of the finished product market, as the representatives of the mills are unwilling to consider any offers of contracts or calls for other material than is now under contract. Movement out of warehouse continues up to the capacity of the warehouses and their ability to supply material. We quote, for stock out of warehouse as follows: Soft steel bars, 4.17c.; iron bars, 4.17c.; structural material, 4.27c.; tank plates, 4.52c.; No. 8 sheets, 5.47c.; No. 10 sheets, blue annealed, 5.52c.; No. 28 black sheets, cold rolled one pass, 6.52c.; No. 28 galvanized sheets, black sheet gauge, 7.77c.

Old Material.—There has been a slightly easier tendency in the scrap market, though prices are still held up well, and about the only transactions of moment have been in material commanding the full Government prices, with the dealers' commissions for handling. Considerable scrap is coming out from the railroads and other sources, and there is also some tendency on the part of dealers to unload, particularly on rolling mill grades. The heaviest consumer of rolling mill material has an embargo in effect, and this has its bearing on the situation. The larger dealers are buying from the railroads and either holding for contract deliveries or pushing through to local consumers. Lists out include 800 tons from the Mobile & Ohio, and 200 tons from the Kansas City Terminal. Railroads are lining up their scrap supplies and larger lists are expected with the coming of the next month. We quote dealers' prices, f.o.b. customers' works St. Louis industrial district as follows:

We quote dealers' prices, f.o.b. consumers' works, St. Louis industrial district, as follows:

	Per Gross Ton	
Old iron rails	$36.00 to	$36.50
Old steel rails, rerolling	34.50 to	35.00
Old steel rails, less than 3 ft.	37.50 to	38.50
Relaying rails, standard sections, subject to inspection	60.00 to	75.00
Old carwheels	29.50 to	30.00
No. 1 railroad heavy melting steel scrap	29.50 to	30.00
Heavy shoveling steel	28.50 to	29.00
Ordinary shoveling steel	28.00 to	28.50
Frogs, switches and guards cut apart	29.50 to	30.00
Ordinary bundled sheet scrap	24.00 to	24.50
Heavy axle and tire turnings	21.50 to	22.00
	Per Net Ton	
Iron angle bars	$35.50 to	$36.00
Steel angle bars	30.00 to	30.50
Iron car axles	42.00 to	42.50
Steel car axles	41.00 to	41.50
Wrought arch bars and transoms	41.50 to	42.50
No. 1 railroad wrought	30.25 to	30.75
No. 2 railroad wrought	29.25 to	29.75
Railroad springs	30.00 to	30.50
Steel couplers and knuckles	30.75 to	31.25
Locomotive tires, 42 in. and over smooth inside	37.00 to	37.50
No. 1 dealers' forge	26.50 to	27.00
Cast iron borings	17.00 to	17.50
No. 1 busheling	26.25 to	26.75
No. 1 boilers, cut to sheets and rings	23.00 to	23.50
No. 1 railroad cast scrap	26.50 to	27.00
Stove plate and light cast scrap	21.00 to	21.50
Railroad malleable	26.50 to	27.00
Agricultural malleable	24.50 to	25.00
Pipes and flues	25.00 to	25.50
Heavy railroad sheet and tank scrap	22.50 to	23.00
Railroad grate bars	20.50 to	21.00
Machine shop turnings	17.50 to	17.75
Country mixed scrap	21.50 to	22.00
Uncut railroad mixed scrap	24.00 to	24.50

San Francisco

SAN FRANCISCO, March 12.

The general situation in the iron and steel trade of the Pacific Coast is changed but little. Bars, pig and scrap remain comparatively easy, and plates are arriving in somewhat better quantity. Some coke has arrived, but not enough to relieve the stringency. Almost no sheets or structural material for general consumption are arriving, although some of the latter is being fabricated at the local mills. There is not enough wrought pipe on the market to come within 50 per cent of the demand outside of the Government supply. The increase in the freight rates March 15 on cast iron pipe has livened up the demand for shipments of this pipe. The expected readjustment of Government prices on April 1 is keeping many buyers out of the market, even for those products on which delivery can be made. The local dealers feel that if the prices fixed next month are announced to be for at least six months, it will be a great deal better for business in the iron and steel circles. The jobbing situation remains the same, with the stocks of sheets and plates at their lowest ebb.

Bars.—The demand for bars remains excellent, especially for reinforcing bars for use in concrete structures. The demand made upon the Pacific Coast Steel Co. has been in excess of its capacity and the company is planning to install another open-hearth furnace in order to keep up with its orders. The Judson Mfg. Co. is also working to capacity to supply the local demand.

Structural Materials.—Practically no structural steel from the Eastern mills is arriving except for Government work. Occasionally a demand for structural steel arises which can be fabricated in the local mills. A recent order of this kind for about 300 tons for a viaduct to be erected in San Francisco went to the Ralston Iron Works.

Plates.—The Eastern mills have been able to supply some plates during the past ten days, and more is promised for the immediate future. Several shipments have arrived and the local dealers are promising buyers a "reasonable delivery" on orders. The uncertainty of the price after the first of next month is holding up orders for future business, but every carload is eagerly seized upon as soon as notice is received of its arrival.

Sheets.—Owing to the scarcity of sheets and the refusal of Eastern mills to promise shipments, it is believed here that the Government is about to place large orders with the sheet mills. The local supply of sheets has been reduced to a minimum and strenuous efforts have been made during the past week to get some promises of delivery from the Eastern mills, but these efforts are not reported to have borne fruit.

Wrought Pipe.—The town of Delano, Cal., recently ordered about two miles of wrought steel pipe, 4 in. diameter, for the waterworks the town is establishing. This is the first order for wrought pipe for municipal purposes in this State for several months. The scarcity of wrought pipe is retarding the development of the oil industry. Leases by companies ready to drill have been abandoned in all the principal oil centers, because equipment was not available. In one district alone 100 such abandonments were noted.

Cast-Iron Pipe.—The desire to have shipment made before the new freight rates become effective has caused the livening up of the market for cast-iron pipe. Delano, which ordered 4-in. wrought pipe for its water works, at the same time ordered about a mile and a half 6-in. and 8-in. cast-iron pipe. The Marin Municipal Water District has ordered 200 tons of 24-in., 18-in. and 12-in. cast-iron pipe. Santa Barbara opened bids on March 9 for 500 tons of 10-in. and 8-in. pipe and the award will be made in a day or two. Pasadena is calling for bids on 200 tons of 4-in., 6-in. and 8-in., to be opened March 12.

Pig Iron.—Compared with other iron and steel products, pig iron is perhaps easier than any. There is a demand, however, for all that can be produced or brought in from the East. Some contracts for delivery in the last half of the year are being taken, but there is practically no pig iron in this market for delivery within the next 90 days.

Coke.—A few cars of coke arrived during the past two weeks, but not enough to relieve the scarcity. The local mills have turned to briquettes made by the Pacific Gas & Electric Co., to replace coke in furnishing the carbon for steel making. Some of the foundries are also turning to the same source. With oil for fuel and briquettes for carbon the local mills are becoming more or less independent of the coke situation.

Old Materials.—The continuation of the wet season in this State has considerably slowed up the receipts of scrap from the old mills located at a distance from the railroads in the mountains. However, there is plenty of scrap on hand for some time to come, and as long as the present prices prevail more will be forthcoming when needed.

Buffalo

BUFFALO, March 18.

Pig Iron.—Iron for Government uses, either directly, on allotment or indirectly, continues to absorb the larger portion of furnace output now going forward. The call for shipment on contracts from all sources is so insistent and of such large aggregate that furnacemen find great difficulty in distributing properly and equitably the comparatively small proportionate amount they have available after supplying Government needs. There has been some further improvement in the car supply for forwarding furnace product, but it is still far from adequate for taking care of the maximum of output. The maximum of production is still hampered and curtailed by shortage of coke and bad coke conditions. Inquiry is of exceedingly heavy volume, aggregating large tonnages for foundry, malleable and basic, but producers are obliged to turn down the greater percentage of it, owing to booked up conditions for all product they are likely to have available for a long period. It is understood that the Gould Coupler Company has succeeded in buying the 15,000 tons of basic which it has had before the market for some time, although the 2000 tons of malleable which it was after for prompt shipment has not yet been placed. It is stated that one stack of a Buffalo district furnace interest will go onto ferromanganese production within a month or six weeks. The new 500-ton furnace of the Lackawanna Steel Co., just finished, will go into blast within the next few days. We continue the schedule of government established prices, f.o.b. furnace, Buffalo:

No. 1 foundry	$34.50
No. 2 X	33.50
No. 3 foundry	32.50
Gray forge	32.00
Malleable	33.50
Basic	33.00
Lake Superior charcoal, f.o.b. Buffalo	39.75

Finished Iron and Steel.—Inquiry for bars has been of fairly good volume during the week and one local mill has booked orders for 400 tons. The same producer has also sold an aggregate of 1000 tons of plates, principally for use in Government work. The demand for structural shapes and for fabricated structural steel has been heavier than for some months, chiefly for factory extensions. One local interest has taken on an aggregate of 550 tons of structural shapes during the week. Plans have been drawn and bids are being taken for a forge building and a machine shop for the Delaney Forge Co., Buffalo, which will require 620 tons of structural steel, and the Ames Iron Works of Oswego is taking bids on an addition to its plant requiring approximately 240 tons. The Lackawanna Bridge Co., Buffalo, has received the contract for plant additions, including an erecting shop for the O'Neil Iron Works, this city, taking 182 tons of fabricated steel. Lupfer & Remick, contracting engineers, Buffalo, are low bidders for a steel bridge over the Erie Canal at Hertel Avenue, Buffalo, requiring about 100 tons of steel. A considerable tonnage of wire and wire nails has been booked by a Buffalo producer, a large portion of which is, directly and indirectly, for Government uses. Shipments from the Pittsburgh district are coming through more freely. Some sales agencies report that mills of their principals are sold ahead to such an extent that the agencies have received instructions not to take on new business until further notice. It is understood that a change in procedure has been adopted in the matter of applications for export licenses for shipment of plates into Canada. The export licenses are now required to be indorsed by the recently organized War Trade Board, of which Frank Jones, president of the Canada Cement Co., formerly of the Dominion Iron & Steel Co., is chairman.

Old Material.—In many grades of scrap the demand exceeds the supply, there being a pronounced scarcity of railroad malleable, old car wheels and No. 1 railroad and machinery cast scrap; also a notable shortage of heavy melting steel and low phosphorus scrap. Many yards are almost bare of all these lines. Cars appear to be a little more plentiful than a week ago, and shipments are moving somewhat more freely in consequence. Some perturbation has been caused among producers of shell turnings and dealers in this vicinity this week on account of a communication received from an Eastern scrap company intimating that it is ready to pay a price in excess of the recently established Government maximum for such turnings, stating that for special purposes it is permitted to pay more than the maximum base price fixed by order of the Government, or the differentials announced by Judge Gary on Feb. 21. Furthermore it is rumored that prices have been paid for shell turnings above $25 at consuming point. This is in the face of a ruling made several weeks ago by the chairman of the American Iron and Steel Institute committee that only first and second cuts of shell turnings could be sold at $25. If such procedure is carried out, dealers and producers say it will threaten a disruption of the existing schedule. It will at any rate make it difficult for dealers and consumers to contract for requirements until it is determined whether this inquiry from the Eastern scrap company is countenanced or authorized by the Government, as it has the injurious tendency of producing a belief among producers that shell turnings may come under the classification of low phosphorus steel scrap. There has been no change in the price of any commodity during the week, and we continue last week's list, as follows, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$30.00
Low phosphorus	40.00
No. 1 railroad wrought	35.00
No. 1 railroad and machinery cast	35.00
Iron axles	$45.00 to 47.00
Steel axles	45.00 to 47.50
Carwheels	30.00
Railroad malleable	35.00
Machine shop turnings	18.00 to 18.50
Heavy axle turnings	25.00
Clean cast borings	19.00 to 20.00
Iron rails	37.00 to 38.00
Locomotive grate bars	25.00
Stove plate	25.00
Wrought pipe	28.00 to 29.00
No. 1 busheling scrap	30.00 to 31.00
No. 2 busheling scrap	22.00 to 24.00
Bundled sheet stamping scrap	22.00 to 24.00

Philadelphia

PHILADELPHIA, March 19.

The impression strongly prevails here that the result of the meeting in Washington to-morrow (Wednesday) between the Committee on Steel and Steel Products of the American Iron and Steel Institute and the War Industries Board will be substantially a reaffirmation of existing prices for a period of six months or more. It is known, however, that there has developed a sentiment among the Government officials in favor of some price reductions, and the result may be a giving way on basic pig iron, iron and steel scrap and possibly one or two items in the finished steel list. There is a feeling that a reduction in basic pig iron, possibly $1 a ton, or to $32, and a slight increase in the price of plates would overcome the criticism which some of the plate makers have offered of the 3.25c. plate price and place them in a position to operate at a profit. A serious situation threatens some Eastern blast furnaces as a result of the commandeering of coke for other furnaces for the production of basic iron for making plates. Among steel plants operating conditions show considerable improvement, and if the rate of progress evident during the past week continues some will soon be operating again at normal capacity.

Pig Iron.—At the meeting in New York last Friday of committees of the American Pig Iron Association and the Eastern Pig Iron Association with the Committee on Steel and Steel Products of the American Iron and Steel Institute it developed that at the price conference in Washington an effort was likely to be made on the part of the War Industries Board to reduce some prices, including basic pig iron. Although there was no discussion of a change in the price of Southern iron, there is known to be a feeling among pig iron men that this subject probably will be brought up at Washington. A large consumer of Southern iron has made strong rep-

resentations in Washington that Southern iron ought to be reduced. The company makes the contention that it erected a plant in the South because of the fact that Southern iron for many years had been on the average $2.50 per ton less than Eastern or Valley iron, but that under the fixed price schedule it is deriving no benefit from its location. According to reports here, there is no inclination to reduce any other kinds of iron than basic and Bessemer. A rearrangement of the schedule of differentials would be necessary, however, inasmuch as steel-making iron prices are based on the price for basic. The Eastern Pig Iron Association committee, which participated in the meeting in New York, was not inclined to consider a reduction in the prices of foundry iron, nor was such a reduction given serious consideration. The commandeering of blast furnace coke by Government order is now a most disturbing problem for Eastern furnaces. The latest order is to divert coke shipments to Birdsboro, Pa., so that a full supply of basic pig iron may be supplied to the Lukens Steel Co. Coke will also be obtained in similar manner for the Alan Wood Iron & Steel Co., which next week will resume full blast furnace operations, one of its furnaces having been banked for many weeks. The Government is taking 27,500 tons of coke a month for the Midvale Steel & Ordnance Co. Several blast furnaces are on the verge of banking because they will not be able to obtain sufficient coke to run, while others which had hoped to resume operations will be unable to do so for some time. A ruling from Washington that buyers of pig iron shall not pay such a commission to dealers as will make the price of the iron to the consumer higher than the Government schedule has disturbed Eastern dealers, who held a meeting in Philadelphia on Monday. Fourteen sellers were present from Boston, New York and Philadelphia. After considerable discussion it was decided that the present moment was inopportune for bringing up the question of the payment of commissions. Steps were taken to form an organization of pig iron distributers. J. G. Miller of Read, Fears & Miller, Dubois, Pa., was appointed to formulate a plan. Except for the sale of a few thousand tons of foundry iron in small tonnages, mostly for second half, there has been no selling in this market in the past week. Inquiries are numerous, however, and selling will no doubt be resumed as soon as the price situation is settled. The Pennsylvania Railroad wants 13,000 tons for second half, of which 1000 to 2000 tons shall be high manganese iron; 1000 to 2000 tons of special low silicon, and 4500 to 9000 tons of No. 2 X foundry, all for delivery to Altoona, Pa. The Standard Steel Works Co., Burnham, Pa., wants 2000 tons of foundry for second half. An Ansonia, Conn., consumer has inquired for 1500 tons for the same period and the Niles-Bement-Pond Co. wants several thousand tons for second quarter and second half. The Baldwin Locomotive Works is after 6000 tons of foundry for second half, the Washington Steel & Ordnance Co., Washington, 300 tons for second quarter, the Essex Foundry, Newark, N. J., 4000 tons for second half, while the principal inquiry for basic iron is from the Penn Seaboard Steel Corporation, Philadelphia, which requires an additional 12,000 tons for second half, it having just recently purchased 12,000 tons from a New Jersey furnace.

Eastern Pennsylvania No. 1 X	$34.50
Eastern Pennsylvania No. 2 X	33.50
Eastern Pennsylvania No. 2 foundry	33.00
Virginia No. 2 X (including freight)	36.77
Virginia No. 2 foundry (including freight)	36.27
Basic	33.00
Gray forge	32.00
Bessemer	36.30
Standard low phosphorus	53.00
Low phosphorus (copper bearing)	50.00

Coke.—As stated in the above paragraph, the supply of blast furnace coke coming into this district has been largely commandeered by the Government, the favored companies being the Midvale Steel & Ordnance Co., the E. G. Brooke Iron Co., the Warwick Iron & Steel Co. and the Alan Wood Iron & Steel Co. The purpose of this commandeering is primarily to increase the production of open-hearth steel for plates. The coke shippers have raised a protest because a considerable portion of the coke commandeered was under a contract price of $9 a ton, while the Government in taking the coke for other furnaces pays only the $6 maximum. We quote blast furnace coke at $6 and 72-hour foundry coke at $7, Connellsville.

Ferroalloys.—The position of ferromanganese remains very firm, with $250, delivered, being quoted generally by all producers. Consumers are being advised that prices are more likely to go upward than downward. Spiegeleisen is also firm and hard to obtain for prompt delivery. The price for the 18 to 22 per cent has advanced to $70, furnace. A sale of 16 to 18 per cent was made last week at $67.50, furnace.

Railroad Equipment.—At its meeting with the War Industries Board in Washington to-morrow (Wednesday) the Committee on Steel and Steel Products of the American Iron and Steel Institute will suggest fixed prices on axles, wheels and tires for cars and locomotives, and the belief here is that these will be promptly adopted. This step is a necessary preliminary to the forthcoming letting of large orders for cars and locomotives by the Government.

Plates.—It would seem that the Government officials in Washington have awakened to the pressing need of speeding up the production of plates. Large specifications have been given out during the past week to steel mills in this district. Not only is the success of advancing the shipbuilding program dependent upon the supply of plates, but the Government will require large tonnages for the construction of cars and locomotives. As a result of the speeding up of plate production, coal is being furnished in much larger quantities and with greater regularity of shipment. Coke for a few blast furnaces has been commandeered so that a full supply of pig iron will be available for the operation of basic open-hearth furnaces at plate mills. The Lukens Steel Co. attained almost maximum production this week and the Alan Wood Iron & Steel Co. will next week start one of its blast furnaces, which has been out of blast for many weeks. Its finishing mills are all in operation. Plate producers are hoping that the meeting in Washington to-morrow (Wednesday) to discuss Government prices will result in an advance on plates, but no one seems to have definite knowledge of what the attitude of the Government representatives will be. If an advance is authorized the question will naturally be asked by the plate makers as to whether the higher price will apply on all unshipped tonnage remaining on the books on March 31.

Structural Shapes.—Some of the smaller producers of structural shapes have asked for a higher Government price, but there seems to be no feeling of optimism that an advance will be authorized. Production at Eastern mills shows betterment. The Eastern Steel Co., which has suffered severely from coal shortage, was operating at about 80 per cent of capacity to-day. The United States Signal Corps has begun the letting of contracts for fabricating portable hangars for use in France. It now seems likely that the total number of buildings will be about 4000, a part of which will be for our Allies. Of this number, about 1400 had been let up to to-day, the Fort Pitt Bridge Works, Pittsburgh, receiving the largest number, about 1000. The Belmont Iron Works, Philadelphia, has received an order for more than 100. Fabricators were asked to take only such work as they could fully complete by May 1. The total quantity of structural shapes in all of the buildings which it is expected will be let exceeds 100,000 tons. The American Bridge Co. has been awarded the contract for aircraft buildings at the League Island Navy Yard, Philadelphia, involving about 2000 tons.

Iron and Steel Bars.—A Youngstown, Ohio, producer is taking on small tonnages of soft steel bars through its local office. Other makers show more of a disposition to quote on inquiries. The bar iron market is quiet. We quote soft steel bars at 2.90c., Pittsburgh, and bar iron at 3.685c., Philadelphia.

Sheets.—An Ohio maker of sheets has taken in the last week a number of miscellaneous orders aggregating a few thousand tons. We quote No. 10 blue annealed sheets at 4.25c., No. 28 black at 5c. and No. 28 galvanized at 6.25c., all Pittsburgh base.

Billets.—There is nothing new in the situation on

billets. Steel makers have none to sell except in rare instances when an old customer must be supplied. We quote open-hearth rerolling billets at $50.50, Philadelphia.

Old Material.—Demand for scrap in the Pittsburgh district is good, but as yet very little is moving in that direction from this market, notwithstanding the fact that eastern Pennsylvana mills are buying very lightly or not buying at all. The market for heavy melting steel shows a weakness which is the more marked because of the strength of its position during the last few months. There are reports of sales to brokers at $28.50. We continue to quote $29 to $30, delivered, but although brokers have been able to buy at $29, it does not appear that steel plants have been able to do so; in fact, a few sales for delivery to steel works were made during the past week at $30. It is stated here that Pittsburgh needs scrap badly, but probably local dealers will not sell unless there is a further recession in the price for delivery in this territory. Present conditions point to such a decline as not at all unlikely. A disturbing condition is the fact that the question of the payment of a commission to brokers and dealers has not yet been settled by the Committee on Steel and Steel Products of the American Iron and Steel Institute. There is said to be a feeling in some quarters that the commission should be abolished entirely. A meeting of the Sub-Committee on Iron and Steel Scrap of the Institute was held in Philadelphia last Friday, and the discussion of present conditions in the scrap trade lasted for many hours. A number of suggestions were made for overcoming difficulties in trading, as, for example, the condition which makes it impossible for badly located plants to pay a sufficient price to obtain scrap in competition with plants which are situated nearer to producing centers, and, which, therefore, have a more advantageous freight rate. A plan may be worked out whereby these badly located plants will be enabled to pay a price that will place them on an equality in buying with better located plants. If the price of basic pig iron is reduced by the Government to $32 per ton it is almost a certainty that a corresponding reduction will be made in the grades of scrap used in basic open-hearth furnaces. We quote the following prices which are now obtainable for delivery to consuming points in the eastern Pennsylvania district:

No. 1 heavy melting steel	$29.00 to $30.00
Steel rails, rerolling	35.00
No. 1 low phosphorus heavy, 0.04 and under	40.00
Low phosphorus, 0.04 and under	37.50
Low phosphorus (not guaranteed)	35.00
Old iron rails	40.00
Old carwheels	30.00
No. 1 railroad wrought	35.00
No. 1 yard wrought	34.00
Country yard wrought	30.00
No. 1 forge fire	27.50 to 28.50
Bundled sheets	27.50 to 28.50
No. 1 busheling	32.00
No. 2 busheling	17.00 to 18.00
Turnings (for blast furnace use)	17.50 to 18.00
Machine shop turnings (for rolling mill use)	18.00 to 18.50
Cast borings (for blast furnace use)	17.50 to 18.00
Cast borings (clean)	20.00
No. 1 cast (for steel plant use)	30.00
No. 1 cast (cupola sizes)	32.00 to 33.00
Grate bars	23.00 to 24.00
Stove plate	23.00 to 24.00
Railroad malleable (for steel plants)	29.00 to 30.00
*Railroad malleable (for malleable works)	35.00
Wrought iron and soft steel pipes and tubes (new specifications)	33.00 to 33.50
Ungraded pipe	30.00

*Maximum price obtainable.

New York

NEW YORK, March 20.

Pig Iron.—A New Jersey foundry is inquiring for 4000 tons of foundry grades for last-half delivery, and this is apparently the only new inquiry formally sent out, but buyers are active in letting sellers know that they are willing to place orders, and as soon as it becomes definitely known what action will be taken in regard to prices for the last half of the year a large volume of orders will be entered. Melters continue to complain that they are unable to obtain satisfactory deliveries, and, in spite of improvement in the car situation in some districts, it seems to be worse than it has been in other sections. We quote as follows for tidewater deliveries:

No. 1 X	$35.25
No. 2 X	34.25
No. 2 plain	33.75
No. 1 Southern	$39.75 to 40.25
No. 2 Southern (rail and water)	39.00 to 39.25
No. 2 Southern (all rail)	39.15 to 39.65
No. 2 X Virginia	37.02

Ferroalloys.—There is more demand for domestic ferromanganese than was the case a week ago and transactions have been more numerous. Besides sales of a fairly large number of small and carload lots, there is noted the purchase of 450 tons for the second quarter at $250, delivered. This seems to be the firm quotation for any delivery. It is intimated that a price of $275 may be established. A Middle Western consumer has bought 600 tons, but it is understood that this involved a deal with a steel producer in which other material was exchanged. A representative of a British maker has sold about 400 tons in the last two weeks. Material is coming over quite regularly. Imports in February were 1417 tons outside of what may have come through the port of New York, and this is estimated to have been 300 to 500 tons. It is now indicated that the Anaconda Copper Mining Co. plans to produce about 30,000 tons a year of electrolytic alloy from its own manganese ores at Butte, Mont. The Butte Copper & Zinc Co. has sold 5000 tons of ore, mostly a carbonate of manganese, to the Steel Corporation and to the Miami Metals Co., Chicago. The spiegeleisen market is very active. Total inquiries amount to 11,000 to 12,000 tons. A Canadian consumer is inquiring for 10,000 tons for delivery in the last half, but will take what it can get earlier. Another inquiry is for 1000 tons for April-May shipments, the silicon to be under 1 per cent. Two other consumers want 500 tons and 200 to 300 tons respectively. This alloy is scarce, and is held at $70 to $75, furnace. There have been sales of 30 to 40 per cent alloy recently at $3.50 per unit. Ferrosilicon, 50 per cent, is active and strong. Sales are being made for last half at $165 to $170 with the quotation for earlier positions held at $170 to $190, depending on quantity and delivery. Sales have been made within these ranges. Some other ferroalloys are quoted in this paragraph the first issue of each month.

Finished Iron and Steel.—Before long a large amount of fabricated steel work will be placed before the market by the construction department of the Quartermaster Department for piers, storage warehouses, etc., at various points on seaboard from Boston down the coast. Some of these are likely to be of reinforced concrete. Bids will be taken for a transformer house by the Bureau of Yards and Docks, Washington, about 125 tons; Westinghouse Church Kerr & Co. have taken bids on a power house at Jersey City for the Central Railroad of New Jersey, 200 tons, and for the Cleveland Brass & Copper Mills, 200 tons; the addition to the Imperial Hotel, New York, 1600 tons, is active, and an addition to the Assay Office, New York, 400 tons, is now up for figures. In addition to the Pennsylvania Railroad work awards noted last week may be mentioned about 600 tons for the New York Central, this work placed with Lewis F. Shoemaker & Co., who have also been given 200 tons more work for the New York Shipbuilding Co. The British Purchasing Commission in New York is trying to place a large tonnage of 2-in. soft billets. Business generally is quiet, both domestic and export, about the only item noted in foreign business being 400 tons of steel bars at 3.75c. to 4c. The trade is waiting on the price settlement conference this week in Washington. Meanwhile railroad shipments are considerably improved. We quote mill shipments of steel bars at 3.095c., New York; shapes, 3.195c.; plates, 3.445c., and bar iron, 3.695c., New York. Out-of-store prices are 1c. higher.

Cast-Iron Pipe.—Contracts for 5000 tons of cast-iron pipe of varying sizes from 4-in. to 30-in. have been placed by the Thompson-Starrett Co. for lines at a new powder plant at Charleston, W. Va. Of this tonnage 2205 tons will be furnished by the United States Cast Iron Pipe & Foundry Co., including 1800 tons of 16-in. to 36-in., 1050 tons of 18-in. to 30-in. and 425 tons of 4, 6 and 10-in. The remaining tonnage will be furnished

by various shops in the South and West. A contract has been placed for 2000 tons for use at the nitrate plant of the Government at Sheffield, Ala. It is understood that this tonnage will be furnished by a Southern company. Cast-iron pipe manufacturers are considerably perturbed on account of the possibility that the Government will rigidly regulate issuing of bonds by municipalities, thus curtailing the laying of cast-iron pipe, except where it is imperatively needed. Government prices are as follows: $55.35 New York for 6-in. and heavier and $58.35 for 4-in.; $65.35 for 3-in., and $1 additional for Class A and gas pipe.

Old Material.—There is a noticeable weakening in the price of heavy melting steel for delivery at eastern Pennsylvania points, as mills in that section are well supplied and not willing to pay the Government price or the commission. There is also some evidence of weakness in the lower grades of cast scrap and in machine-shop turnings. We quote prices of brokers as follows to New York producers and dealers per gross ton, New York:

Heavy melting steel	$26.70 to $27.50
Rerolling rails	32.50
Relaying rails	60.00 to 70.00
Iron and steel car axles	45.00
No. 1 railroad wrought	32.75
No. 1 railroad wrought cut to not less than 10 in. or over 24 in.	37.80
Wrought-iron track scrap	32.80
No. 1 yard wrought long	31.80
Light iron	9.00 to 10.00
Cast borings (clean)	17.80
Machine-shop turnings	16.50
Mixed borings and turnings	14.50 to 15.50
Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long	30.75

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:

No. 1 machinery cast	$35.00
No. 1 heavy cast (columns, building materials, etc.)	32.00
No. 2 cast (radiators, cast boilers, etc.)	30.00
Stove plate	$22.00 to 22.50
Locomotive grate bars	22.00 to 22.50
Malleable cast (railroad)	31.75
Old carwheels	27.75

British Steel Market

Scarcity of Pig Iron and of American Semi-Finished Steel—Tin Plate Labor Troubles

(By Mail)

LONDON, ENGLAND, Feb. 12.—Conditions remain as stringent as ever, the filling of national and Allied needs taxing the country's resources fully. A bricklayers' strike in Wales hindered operations at the steel works there but this has been settled, and labor conditions generally have improved. Means of transport, however, leave much to be desired. Export business is badly dislocated while embargo restrictions have become intensified. The margin of supplies now left, after satisfying essential needs, is down to vanishing point and overseas' business is practically at an end.

Deliveries of pig iron are accelerated as far as possible, but there is a shortage in the Midlands owing to the reduced number of furnaces running on ordinary iron and the scarcity may not be relieved for a while. In the Cleveland area orders were placed easily enough against the February allocations, but deliveries depend chiefly on the traffic position, otherwise users would be comfortably situated. Several furnaces on basic have been changed back to foundry iron. The demand for hematite is in excess of the supply and deliveries against old allocations for Italy are still hung up with not much hope of their being worked off.

Semi-finished steel is intensely stringent with not the least hope of easier conditions. The official price of Welsh sheet bars and billets remains pegged at £10 7s. 6d. net f.o.t. Shell discard billets are hard to get. American supplies have virtually ceased to come in, and c.i.f. business through merchants is no longer possible under the present deadlock in shipping. Small lots of wire rods intended for transshipment to France are held up in Liverpool warehouses pending permits.

In finished steel there has been no development in the way of an official price adjustment since the advance already noted in the quotation of marked iron bars to £16 net f.o.t. at works and the delayed announcement of a revision of the price of unmarked bars is holding up new business. There is an unabated demand but the placing of orders is almost impossible except for direct war work. As regards steel material, merchant applications are now meeting with scant consideration, the works attention being entirely focused on urgent government orders, particularly munition work since the recent pressure in ship-building material has subsided. It is understood that needs in this direction are well provided for. There is a lively demand for bars and angles made of shell discards and prices have been raised about 5s. a ton to £16 15s. net f.o.b. Considerble activity prevails at shipyards. The tin-plate trade has been colorless. French needs are provided for well over the current quarter, but the execution of contracts is in arrears, partly owing to recent labor troubles in Wales, although the larger makers have not been much affected. The home demand is quiet but the maximum basis price has risen automatically with the advance in tin and now stands at 31s. 9d. net f.o.t. for cokes 20 by 14.

Ferromanganese is unchanged. If anything the tendency is rather firmer. One or two orders have been arranged lately for forward shipment to North American Atlantic ports at about 250 c.i.f. for loose, which is the current quotation. There seems to be a regular business with Continental ports, with a constant demand from that quarter for moderate quantities, but licenses are not being issued freely.

Milwaukee Metal Trades and Founders' Association

Richard P. Tell, president and general manager National Brake & Electric Co., Milwaukee, was re-elected president of the Milwaukee Metal Trades and Founders' Association at the annual meeting held Friday evening, March 15, at the Hotel Pfister. John D. Bird, general manager Worthington Pump & Machinery Corporation, Cudahy, was re-elected vice-president. William J. Fairbairn again was elected secretary and manager. The work of the treasurer is handled by the First Savings & Trust Co., Milwaukee. This year the association dispensed with its annual banquet and confined its annual meeting to a strictly business session.

The principal work of the association during the next few months will be to conduct an industrial efficiency campaign under the direction of the Emerson Institute, New York. A mass meeting to introduce the campaign will be held in the Auditorium on March 26. George F. Barker, president New York Efficiency Club and chief of staff Emerson Institute, will be the principal speaker. The local work is in charge of William Lyman, New York, an efficiency expert, who will spend 10 weeks in Milwaukee.

Fabricated Steel Business in February

About 100,000 tons of fabricated steel work was contracted for in February, following 95,000 tons in January, according to records collected by George E. Gifford, secretary of the Bridge Builders and Structural Society, 50 Church Street, New York. In February he finds that 55½ per cent of the capacity of the bridge and structural shops of the country was put under contract. The figure for January was 53 per cent, while for all of 1917 it averaged 59.5 per cent. In the first two months of 1912 205,000 tons of fabricated steel work were bought; in the first two months of 1913 220,000 tons, and in the first two months of 1914, 215,000 tons. How much of the 195,000 tons for the first two months of 1918 is war business is not clear.

IRON AND INDUSTRIAL STOCKS

Market Is Firm, but Dealings for Both Speculation and Investment Are Light

NEW YORK, March 18.

Price levels remained practically unchanged the past week after slight fluctuation back and forth. A few issues showed wide swings, where special factors influenced buying or liquidation. Legislation by Congress and 15 per cent increase in freight rates did not bear directly enough on iron and steel stocks to indicate any appreciable effect. The largest range of steel mill stocks was a rise of 2¾ points in Sloss-Sheffield Steel & Iron, com. United States Steel, com., showed no change in value after total sales for the week of 165,800 shares; pref. fell off ⅛ point.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com.	24¼- 25⅞	Int. Har. of N. J. com.	120
Allis-Chalm. pf..	80⅝- 80¾	Lacka. Steel	79½- 80¾
Am. Can com...	40⅛- 43⅝	Lake Super. Corp.	15¾- 16
Am. Can pf.....	94⅛- 96⅝	Midvale Steel ...	44¾- 45⅛
Am. Car & Fdry. com.	74⅝- 77⅞	Nat.-Acme	27¼- 29½
Am. Loco. com..	63¾- 67	Nat. En. & Stm. com.	48 - 49½
Am. Loco. pf.....	99½	Nat. En. & Stm. pf.	97¾
Am. Radiator com.....	260	N. Y. Air Brake.	124 -126
Am. Ship com...	97½- 98	Nova Scotia Steel.....	63
Am. Steel Fdries.	63 - 66	Press. Steel com.	61½- 62
Bald. Loco. com.	74¾- 78⅝	Ry. Stl. Spr. com.	52⅞- 54⅞
Bald. Loco. pf...	98⅞- 99	Ry. Stl. Spr. pf.....	96¼
Beth. Steel com.	79¾- 80⅝	Republic com. ..	78¼- 80
Beth. Stl., Cl. B.	76⅝- 79¾	Republic pf.	97
Case (J. I.) pf..	84 - 85½	Sloss com.	53 - 55¾
Cent. Fdry. com.	30 - 35½	Superior Steel.....	36
Cent. Fdry. pf...	45 - 47	Un. Alloy Steel.....	40
Chic. Pn. Tool...	54½- 59¾	U. S. Pipe com.....	14
Colo. Fuel	38½- 39	U. S. Pipe pf.....	45
Cruc. Steel com..	63 - 66½	U. S. Steel com..	89⅞- 92
Cruc. Steel pf.....	90	U. S. Steel pf....109¾-110	
Deere & Co. pf..	95½- 95¾	Va., I., C. & C...	66 - 68
Gen. Electric ...135	-140	Warwick 8 1/16-	8¼
Gt. No. Ore Cert.	28 - 29¼	Westingh. Elec..	41¼- 42
Gulf States Steel.....	90½		

Industrial Finances

The American Radiator Co. earned a net profit of $3,261,871 in 1917, after allowing for all deductions including the excess profits tax, which was an increase of $657,804 over the result in the preceding year. Together with the earnings of the Canadian, English, French and Italian subsidiary concerns, the profit of the organization amounted to $4,214,427. The parent corporation's net was equivalent to 24.8 per cent on the common stock, while the combined profits were equal to 32.6 per cent on the junior stock issue.

The surplus of the parent company on Jan. 31 last was $6,420,093, and the aggregate surplus of the constituent concerns was $8,517,472. The management announced that a reserve of $1,250,000 had been set aside in the last three years as an offset to possible declines in commodity prices in the future.

The annual report of the Charcoal Iron Co. of America, Detroit, will be submitted to the stockholders at their annual meeting in Detroit, March 28. Net earnings for the year will reach more than $2,100,000 after payment of all overhead charges and reasonable depreciation. After providing for United States excess profits taxes and an amount for extraordinary depreciation, the earnings applicable to dividends on the preferred and common stocks were about $1,500,000. This is at the rate of $4.20 a share on the common stock (par value) $10 a share after payment of preferred dividends. The report for the final quarter of the year ended Dec. 31, 1917, shows profit from operation after deducting all expenses, including management, salaries, stumpage on cordwood and timber, relining furnaces and other accruing renewals, of $951,294.13. The balance sheet with assets of $11,983,256.33 stands practically the same as at the close of the previous quarter with the exception of $340,000 added to the property account, making a total of $9,901,902.25.

On April 1 the Struthers Furnace Co., operating a blast furnace at Struthers, Ohio, will redeem at 102½ all outstanding first mortgage and collateral trust gold 6's issued Oct. 2, 1911, through the Guardian Savings & Trust Co., Cleveland. The authorization of these bonds was $1,000,000, of which $750,000 were issued. The bonds did not finally mature until April, 1926, and consequently redemption of all those outstanding is far in advance of maturity. The company anticipated some payments on these bonds a year ago.

As receiver of the Regal Motor Car Co., Detroit, the Court has appointed the Security Trust Co., that city.

The capital stock of the Laclede Steel Co., St. Louis, operating a plant on the east side of the river in Illinois, has been increased from $1,400,000 to $2,200,000 and the board of directors has been increased from five to seven, the new members being Warren Goddard and H. Herndon Smith, both of St. Louis. Thomas R. Akin continues as president. The Laclede company recently acquired the plant, of the Valley Steel Co. and this as well as the need for more working capital was the occasion of the increase in capital stock.

More than doubling sales and profits, the United Alloy Steel Corporation had in 1917 the most successful 12 months in its history. Its gross sales were approximately $33,700,000 as compared with $16,700,000 in 1916 and $9,800,000 in 1915, owing largely to the increase in production due to the new plant. Net profits were $6,400,000 as contrasted with $3,000,000 a year ago and $2,600,000 in 1915. After depreciation and federal taxes, the latter alone amounting to $1,500,000, or $3 a share on the capital stock, the company earned $4,400,000, equivalent to $8.80 a share.

Creditors of Barney & Berry, Inc., skate manufacturers, Springfield, Mass., have asked for the appointment of a receiver and the company has expressed a willingness to accede to such an appointment. Louis C. Hyde, speaking for the company, says that it has assets enough to nearly three times cover the indebtedness, but the company is short of available cash and long on manufactured stock. A statement filed with the bill showed assets, Feb. 1, 1918, of $694,368.

The McKeesport Tin Plate Co., McKeesport, Pa., has filed an amendment to its articles of incorporation at Harrisburg, Pa., increasing its capital stock from $3,000,000 to $10,000,000.

Dividends

The American Brake Shoe & Foundry Co., quarterly, 1¾ per cent on the common, 2 per cent on the preferred and extra 1 per cent on the preferred, all payable March 30.

The E. W. Bliss Co., quarterly, 1¼ per cent and extra 11¼ per cent on the common and 2 per cent on the preferred, payable April 1.

The Canadian Locomotive, quarterly, 1½ per cent on the common and 1¾ per cent on the preferred, payable April 1.

The Central Foundry Co., quarterly, 1¼ per cent on the preferred and 2 per cent on the first preferred, payable April 15.

The Colt's Patent Fire Arms Mfg. Co., quarterly, $2.50, payable April 1.

The International Harvester Co. of New Jersey, quarterly, 1¾ per cent on the common, payable April 15.

The Sloss-Sheffield Iron & Steel Co., quarterly, 1¾ per cent on the preferred, payable April 1.

The United Shoe Machinery Co., quarterly, 50c. on the common and 37½c. on the preferred, payable April 5.

The E. I. du Pont de Nemours Co., Wilmington, Del., has announced a change in its bonus system, effective March 1. Instead of the straight 20 per cent bonus heretofore in effect, there will be a bonus of 35 per cent on the first $100 monthly salary, 30 per cent on the second hundred and 22 per cent on the third hundred dollars. The new plan applies to all those employed by the company previous to July 1, 1917. The company has advanced the wages of employees at its works at Pompton Lakes and Haskell, N. J., 20 per cent.

The New York Shipbuilding Corporation, Camden, N. J., will build about 1000 two-story houses on Seventh, Eighth, Ninth and Tenth Streets, and Woodland Avenue for the use of its employees, at a total cost of about $2,500,000.

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
		Electro-	New	New	St.	New	St.
Mar.	Lake	lytic	York	York	Louis	York	Louis
13	23.50	23.50	*85.00	7.25	7.10	7.75	7.50
14	23.50	23.50	*85.00	7.25	7.10	7.75	7.50
15	23.50	23.50	*85.00	7.25	7.10	7.75	7.50
16	23.50	23.50	*85.00	7.25	7.10	7.75	7.50
18	23.50	23.50	*85.00	7.25	7.10	7.75	7.50
19	23.50	23.50	*85.00	7.25	7.10	7.75	7.50

*Nominal.

NEW YORK, March 20.

All the markets are extremely dull and without feature, even tin. Supplies of copper are said to equal present needs. Tin is decidedly quiet, with spot metal still practically unobtainable. Lead is inactive and easier. Spelter is lifeless and weaker. Antimony is unchanged.

New York

Copper.—It is stated in the trade that there is enough copper to meet present needs and that there is no anxiety. Some domestic consumers, however, who have no Government contracts are having some difficulty in getting metal promptly. Less is heard of higher prices for copper June 1, when the present arrangement expires. Much may happen to change conditions between now and then. Certain consumers buying small jobbing lots are resorting to scrap copper which they can purchase under the jobbing price of 24 67½c. and not far from the price for large lots of 23.50c.

Tin.—Business in tin has suddenly come to an almost complete stop after many weeks of considerable activity in futures. There was a little business done in futures on Monday, March 18, but in the last 10 days it is estimated that not over 400 tons of tin have been sold. Cables continue to be abnormally late. Both Straits and Banca tin are unobtainable for spot delivery, but are nominal at 85c., New York. Arrivals to March 18, inclusive, have been 1202 tons with 6300 tons reported afloat. The London market yesterday was £1 under that of a week ago for spot Straits, or £321 10s. per ton.

Lead.—The market continues very quiet with no interesting features. It is a drifting market with buyers few. There have been more free offerings but they have not amounted to much. The entire situation is easier, due almost entirely to the better weather conditions. The quotation of the leading interest continues unchanged at 7.25c., New York, with the outside market also 7.25c., New York. The St. Louis market is about 7.10c.

Spelter.—The market continues to weaken if anything, although the quotation is not any lower than a week ago. Prime Western for early delivery is held at 7.50c., St. Louis, or 7.75c., New York, but it can probably be bought at 7.37½c., St. Louis, or 7.62½c., New York, which some producers are now quoting. Small sales at this level are heard of but not confirmed. Demand is very light though sales are being made spasmodically. Unquestionably there is very little if any profit at these levels, according to market opinion. Production continues to contract and must proceed to do so further, it is thought, before the market can show any strength. Grade A, which makes up the bulk of the Government's purchases, is officially held at 12c. per lb., while sheet zinc is quoted at 15c. per lb. Spot prime Western is selling as high as 8c., New York, where it is reported scarce.

Antimony.—There is very little demand outside of the Government's purchases which are not made public. The quotation is unchanged at 13.25c., New York, duty paid, for prompt and March shipment of Chinese and Japanese grades.

Aluminum.—The Government price of 32c. per lb. for 50-ton lots and larger is the ruling price in a quiet market. For 15-ton lots and over, a price of 32.10c. per lb. has been established and for 1-ton lots and over, a price of 32.20c.

Old Metals.—The market is quiet. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	23.50
Copper, heavy and wire (nominal)	23.50
Copper, light and bottoms	21.00 to 21.50
Brass, heavy	16.25 to 16.50
Brass, light	12.25 to 12.50
Heavy machine composition	23.75 to 24.00
No. 1 yellow rod brass turnings	13.50 to 14.00
No. 1 red brass or composition turnings	19.00 to 20.00
Lead, heavy	6.50 to 6.75
Lead, tea	5.25
Zinc	6.00

Chicago

MARCH 19.—Better transportation is enabling more copper to come through, but it is none too plentiful. The demand is good and experience has shown that a large order must be distributed among several smelters. The refiners claim they are well filled with orders, but it is also thought that they desire to keep themselves in a position to care for large and sudden Government orders. The tin situation is acute, there being plenty of the metal, but confined to hands which cannot resell, because of Government restrictions. Lead prices are irregular, especially at St. Louis. Spelter and antimony are quiet. We quote copper at 23.50c. in carloads and 24.67½c. in part carloads; tin, 90c.; spelter, 7.50c.; lead, 7.15c.; and antimony at 15.50c. to 16c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 21c.; copper clips, 20c.; copper bottoms, 19c.; red brass, 20c.; yellow brass, 14.50c.; lead pipe, 5.50c.; zinc, 5c.; pewter, No. 1, 45c.; tin foil, 50c., and block tin, 60c.

St. Louis

MARCH 18.—The non-ferrous metals markets were dull during the week with very little change in quotations or in tone to relieve the monotony. The close to-day in carload lots on lead was at 7.04c. to 7.10c.; spelter, 7.50c. In less than carload lots the quotation was for lead, 7.50c.; spelter, 8.25c. Tin was quotable at 90c., with none available; copper, 25.12c.; antimony, Asiatic, 17.50c. In the Joplin ore district the situation had very little that was new, owing to the difficulty in making shipments to smelters, which, in consequence, were not over eager to make purchases. The range on zinc blende, basis of 60 per cent metal, was $50 to $67.50 per ton, with the average for the week at $55, on account of the excess of second-grade ores sold. The first grade producers are holding their ore for better prices to some extent. Calamine was quiet at $30 to $34 per ton, basis of 40 per cent metal, with the average for the week for the district at $33 per ton. In lead the tone continued strong at $87.50 per ton for the top grades, basis of 80 per cent metal, and there were reports of sales at even higher prices, but these could not be confirmed. The average for the week for the district was $86 per ton. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 10c.; heavy yellow brass, 14c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 20c.; zinc, 5c.; lead, 5.50c.; tea lead, 5c.; pewter, 25c.; tinfoil, 50c.

Strikes at Iron and Steel Plants

Employees in the mounting and tank liners department of the J. L. Mott Co., Trenton, N. J., declared a strike, March 13, for a wage advance of 20 per cent.

Foundrymen and molders at the plant of the Hubley Mfg. Co., Elizabeth Avenue, Lancaster, Pa., manufacturer of iron and steel castings, have been granted a wage advance of 10 per cent without solicitation.

Taking exception to the employment of a new foreman, about 700 employees at the boiler works of the John Wood Mfg. Co., Conshohocken, Pa., declared a strike on March 11. The company is engaged in manufacturing boilers for the Government. The men returned to work on March 14, following the employment of a satisfactory foreman.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb., New York, 19.5c.; Philadelphia, 18.5c.; Boston, 21.5c.; Buffalo, 11.6c.; Cleveland, 13.5c.; Cincinnati, 18.5c.; Indianapolis, 20c.; Chicago, 21.5c.; St. Louis, 27c.; Kansas City, 47c.; minimum carload, 36,000 lb.; St. Paul, 40c.; minimum carload, 36,000 lb.; Denver, 79c.; minimum carload, 36,000 lb.; Omaha, 47c.; minimum carload, 36,000 lb.; New Orleans, 30.7c.; Birmingham, 46c.; Pacific Coast, $1.00; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is $1.05, minimum carload, 40,000 lb.; and $1.00, minimum carload, 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 40c., minimum carload 46,000 lb.; to St. Paul, 35.5c., minimum carload 46,000 lb.; Denver, 79c., minimum carload 46,000 lb. A 3 per cent transportation tax now applies. On iron and steel items not noted above, rates vary somewhat, and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, structural sizes, 3c.

Wire Products

Wire nails, $3.50 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire and fence staples, $4.35; painted barb wire, $3.65; polished fence staples, $3.65; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large rivets ..... $4.65 base
7/16 in. x 6 in. smaller and shorter rivets..45-10 per cent off list
Machine bolts h.p. nuts, ¾ in. x 4 in.:
Smaller and shorter, rolled threads....50-10-5 per cent off list
Cut threads ..... 50-5 per cent off list
Larger and longer sizes..... 40-10 per cent off list
Machine bolts c.p.c. and t. nuts, ⅞ in. x 4 in.:
Smaller and shorter..... 40-10 per cent off list
Larger and longer..... 35-5 per cent off list
Carriage bolts, ¾ in. x 5 in.:
Smaller and shorter, rolled threads..... 50-5 per cent off list
Cut threads ..... 40-10 per cent off list
Larger and longer sizes..... 40 per cent off list
Lag bolts ..... 50-10 per cent off list
Plow bolts, Nos. 1, 2, 3..... 50 per cent off list
Hot pressed nuts, sq., blank..... 2.50c. per lb. off list
Hot pressed nuts, hex., blank ..... 2.30c. per lb. off list
Hot pressed nuts, sq., tapped..... 2.30c. per lb. off list
Hot pressed nuts, hex., tapped..... 2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank..... 2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped..... 2.00c. per lb. off list
Semi-finished hex. nuts:
⅝ in. and larger..... 60-10-10 per cent off list
9/16 in. and smaller..... 70-5 per cent off list
Stove bolts ..... 70-10 per cent off list
Stove bolts ..... 2½ per cent extra for bulk
Tire bolts ..... 50-10-5 per cent off list

The above discounts are from present lists now in effect. All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57; chain rods, $65; screw, rivet and bolt rods and other rods of that character, $65. Prices on high carbon rods are irregular. They range from $70 to $80, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16 in. x 4½ in. and heavier, per 100 lb., $3.90, in lots of 200 kegs of 200 lb. each, or more; track bolts, $4.90. Boat spikes, $5.25 per 100 lb., f.o.b. Pittsburgh.

Terne Plate

Effective Nov. 7 prices on all sizes of terne plates are as follows: 8-lb. coating, 200 lb., $15 per package; 8-lb. coating, I. C., $15.30; 12-lb. coating, I. C., $16.75; 15-lb. coating, I. C., $17.75; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. from mill, and 4.50c. to 5c. from warehouse in small lots for prompt shipment. Refined iron bars, 3.50c. in carload and larger lots, f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv
⅛, ¼ and ⅜	44	17½	⅛ and ¼	23	+4
½	48	33½	⅜	24	+3
¾ to 3	51	37½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	44	31½	1¼	18	3
2½ to 6	47	34½	1½	25	11
7 to 12	44	30½	2	26	12
13 and 14	34½	..	2½ to 6	28	15
15	32	..	7 to 12	25	12

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	40	22½	⅛, ¼ and ⅜	22	5
½	45	32½	½	27	14
¾ to 1½	49	36½	¾ to 1½	33	18
2 to 3	50	37½			

Lap Weld, extra strong, plain ends

2	42	30½	1¼	19	4
2½ to 4	45	33½	1½	25	11
4½ to 6	44	32½	2	27	14
7 to 8	40	26½	2½ to 4	29	17
9 to 12	35	21½	4½ to 6	28	16
			7 to 8	20	8
			9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh, announced Nov. 13 as agreed upon by manufacturers and the Government:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	34	3½ to 4½ in.	12½
2½ to 3¼ in.	24	3 to 3¼ in.	+ 5
2¼ in.	17½	2½ to 2¾ in.	+ 7½
1¾ to 2 in.	13	2 to 2¼ in.	+22½
		1¾ to 1⅞ in.	+35

Standard Commercial Seamless—Cold Drawn or Hot Rolled

	Per Net Ton		Per Net Ton
1 in.	$340	1¾ in.	$220
1¼ in.	280	2 to 2½ in.	190
1⅜ in.	270	2¾ to 3¾ in.	180
1½ in.	220	4 in.	200
		4½ to 5 in.	220

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days:

Blue Annealed—Bessemer	Cents per lb.
No. 8 and heavier	4.20
Nos. 9 and 10	4.25
Nos. 11 and 12	4.30
Nos. 13 and 14	4.35
Nos. 15 and 16	4.45
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.80
Nos. 22 and 24	4.85
Nos. 25 and 26	4.90
No. 27	4.95
No. 28	5.00
No. 29	5.10
No. 30	5.20
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	5.25
Nos. 12 and 14	5.35
Nos. 15 and 16	5.50
Nos. 17 to 21	5.65
Nos. 22 and 24	5.80
Nos. 25 and 26	5.95
No. 27	6.10
No. 28	6.25
No. 29	6.50
No. 30	6.75
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.80
Nos. 17 to 21	4.85
Nos. 22 to 24	4.90
Nos. 25 and 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.05
Nos. 30½ and 31	5.10

ELECTRIC SMELTING IN BRAZIL

Plans for the Beginnings of a Domestic Iron Industry

BY KIRBY THOMAS*

THE general recognition of the fact that there are in the interior of Brazil, within 300 to 400 miles of the southern coast, deposits of iron ore, more extensive and of higher average iron content than any other deposits in the world, has led the Brazilian Government to give special consideration to the possibilities of utilizing these resources as a basis for the establishment of a much needed iron and steel industry in that country. For more than 100 years there has been a small and interrupted production of pig iron from these ores, in charcoal blast furnaces. However, the supply of charcoal in the iron region is exceedingly limited and the production of any considerable or increased amount of iron in this manner is impracticable.

Coal Supply

In the hopes of discovering a suitable supply of coal for the purpose of establishing an iron industry and for industrial uses, the Brazilian Government some years ago arranged for an investigation of the known coal fields by I. C. White, an American coal geologist. The results of this investigation were not encouraging. The coal basin, which lies in the southern part of the republic, was found to be extensive but the coal, while of fair quality, was so mixed with slate and impurities that it was not practicable to use it for commercial purposes, except in a limited way or after treatment, by various processes which are yet in the state of experimentation. There is a possibility that a better grade of coal will be found in the deeper and unexplored part of the basin and plans have been made to undertake some drilling explorations with the assistance of the government. There is the possibility and an expectation that other and better coal deposits will yet be found in Brazil, particularly in the great interior Amazon basis, which corresponds geologically, in some respects at least, in its formations and age, to the North American region lying north and west of the Appalachian "backbone."

In the meantime, the electrical smelting of iron ore has not been overlooked. In 1914, the School of Mines at Ouro Preto, Brazil, published a monograph entitled "Industria Siderurgica," by Cladamira de Oliveira, in which were discussed fully the technical and commercial data concerned in electrical smelting in Brazil, based on the results obtained in Sweden, the United States and elsewhere. The conclusions were definitely favorable to the project of electrical smelting, assuming a policy of governmental assistance of the industry.

Brazilian Representatives Now in the United States

About this time the foreign interests took up the idea of transporting the ore over electrically equipped railroads to the nearest seaport and thence by special line of steamers to Europe and the United States. This movement diverted the project of domestic smelting for a time, but the idea has again been revived, incident to the Brazilian efforts to establish an effective policy of internal development. Some blanket concessions have unfortunately been granted to local interests, but the field is by no means controlled and the federal and state governments are very alert to any policy which will result in fully realizing upon the iron ore resources of the country by their utilization in a domestic industry. Representatives of Brazilian interests are now in the United States investigating electrical smelting methods and securing data on which to base general proposals to the home governments and capital.

The region of the iron deposits in Brazil is an elevated plateau country with a healthful climate, now generally well settled and containing numerous large, permanent and swift flowing rivers which would furnish cheaply sufficient electrical power for a large industry, if the other conditions are found to be commercial.

As a matter of fact, the deposits of iron ore are so extensive there being actually billions of tons above ground and accessible, that the development of a local smelting industry can have no effect upon the very important projects for the mining and shipping of these ores to Europe and America, which were in active processes of realization at the beginning of the war and which will undoubtedly be again taken up when normal political and commercial conditions are established throughout the world.

[The extent and value of the Brazilian iron ore deposits were discussed in THE IRON AGE, Oct. 15, 1914, in an article by E. C. Harder, entitled "Iron Industry of Brazil."]

*Mining engineer, 165 Broadway, New York.

Foundry Sand-Blast Equipment

Deprecating the efforts of German manufacturers of sand-machinery, who, he said, are endeavoring to build absolutely automatic machines and, in his opinion, consequently are developing refinements and weaknesses requiring operation too slow, at least for American practice, H. L. Wadsworth, Sand Mixing Machine Co., Cleveland, in a paper prepared for the meeting of the American Foundrymen's Association in Boston last September, held that for all but the lightest castings, provided conditions are proper for the operator, hand operation is superior to and more efficient than automatic operation. With hand operation, he contended, spots of scale which are found hard may be given extensive cleaning, while softer spots may be more rapidly passed over. With this in mind, he said, sand-blast machinery manufacturers are aiming in their designs for strong well placed exhausts in connection with proper lighting of the work.

For medium-sized castings weighing from 50 to 500 lb. which do not require handling by a crane and which are too large to be handled in tumblers or automatic machines, he considers the rotary type of sand-blast room, consisting of a heavy revolving table frame divided into two parts by a heavy cast-iron partition, popular, especially in automobile and light machinery foundries. With such equipment, he explains, the operator works in a small steel room and when he has finished the castings on which he is working, he revolves the table a half turn, which takes the finished work out of the room and puts the new work before him ready to blast. To this equipment he attached the following advantages: Less floor space for a given tonnage; reduced and strongly lighted working area so that there are no shadows, and practically continuous operation with correspondingly high efficiency and low costs. Endeavors to improve further on the rotary table type of sand-blast room, he said, led to the design of a room in which the operator stands outside, viewing the work through a fine mesh brass wire screen, the sand-blast nozzle being operated through a slot of soft rubber in the steel casing of the room. However, in his opinion, the necessity of the operator being inside the blast room is no disadvantage. These outfits he held especially valuable for boiler sections, furnace parts, gears, machine parts, etc.

For practically all work a hard grained flint sand manufactured from quarry rock of comparatively fine mesh gives, he said, the fastest cutting. It is his opinion that foundrymen are becoming converted to the use of fine hard white sand which does not break up into dust as soon as it hits the work. A soft sand, he said, does not transmit the force of the air and breaks up quickly, causing unnecessary dust in the room. He believes that careful study of abrasives will lead to material saving.

The Southern Railway Supply & Equipment Co. of St. Louis will erect a 7-story and basement building at Seventeenth and Olive streets, where it will remove when the building is completed. The structure will be 80 by 117 ft., of concrete construction, and will cost about $200,000 finished. The company is headed by J. C. Reed as president, with Ephron Catlin as secretary and treasurer and Walter D. Achuff as vice-president and sales manager. It is at present at 1113 Second Street, North, and is capitalized at $200,000.

Abolishing the Name German Silver

A movement is on foot to abolish the designation German silver, the familar alloy of copper, nickel and zinc, and to substitute the name "nickel silver." The American Brass Co. has already made the change and it is one of the largest producers. The *Metal Industry* argues as follows against even the name silver, advocating an entire change of nomenclature:

The matter has taken on added importance in view of the fact that the largest brass producing company of the United States has lately changed the name of the alloy known as German silver to nickel silver. It seems to us that if a change in name of this material is to be made that we should not stop half way. Why retain the word silver? Why attempt to ennoble a combination of base metals? Surely there can be no other reason than a commercial one. If the nickel is taken from an 18 per cent German silver alloy only a "two and one" brass will remain. Why not then call the compound "nickel brass," or if commercial objections are too strong to be overcome at once why not call it nickel alloy? The various contents of nickel may be designated by utilizing the different percentages that the alloy contains. Thus four, six, eight, ten, twelve, fifteen, eighteen, etc., per cent nickel alloy. It is a fact that some manufacturers are already designating the material now being sold as "Sheffield plate" as "silver plate on a nickel base." We see no reason why the same argument does not apply to the alloy now being called nickel silver. As a matter of fact the new name is no more correct than the one it supplants, for the alloy contains no silver, and while it is admitted to possess some similar physical characteristics it has really no claim to nobility.

Selling Thrift Stamps at Hartford

A well-organized movement is in progress in the factories of Hartford, Conn., to promote the sale of thrift stamps. About five weeks ago the Underwood Typewriter Co. made a gift of a thrift card, with a 25-cent stamp attached, to each employee. The number of employees is about 4000, and the weekly sale of stamps is about 5000, or $1,250 in cash. The plant has 57 departments, and in each department a clerk attends to the stamp sales. About the same time the Pratt & Whitney Co. began a campaign. The practice of this plant differs in this respect; any employee presenting a thrift card with 15 stamps in place receives a present from the company of the sixteenth stamp. The time for presentation of the card for the final stamp is not limited to pay day, but the card may be exhibited any noon and the book completed. The Colt's Patent Fire Arms Mfg. Co. has also started a similar movement by presenting each of its 5700 employees with a thrift card with a 25-cent stamp attached. There are about 50 pay stations in the plant and at each pay station there is provision for weekly sale of thrift stamps. The Hartford Machine Tool Co. and several other factories are initiating the same movement.

Change in Wharton Steel Co.

J. Leonard Replogle has resigned as chairman and director of the Wharton Steel Co., probably because of his identification with the Council of National Defense as director of steel supply, and J. H. Hillman, Jr., Pittsburgh, has been elected a director. John E. Perry has retired as president, becoming the president of the Valley Mould & Iron Co., and he is succeeded as president by W. H. Brevoort, who has been a director of the company for some time. Charles B. Ellis, an associate of Mr. Replogle in affairs of the American Vanadium Co., has also been elected to the directorate of the Wharton Steel Co.

The Manufacturers' Council of the State of New Jersey, the organization for taking care of the distribution of war business within New Jersey, will hold a convention at Atlantic City on June 12. Meanwhile directors' meetings are to be held in various cities: on April 3 in Camden; April 17 at the Robert Treat Hotel, Newark; May 1 at Trenton, and May 15 at Paterson. The association has established at Washington offices in the Stewart Building, Sixth and D Streets, N.W.

Employers' Meeting in Hartford

The annual meeting of the Employers' Association of Hartford County was held at the Hartford Club, Hartford, Conn., March 13. Employers' organizations in Boston, Providence, Worcester and Pittsfield, Mass.; Springfield, Mass.; Hartford, Meriden, New Haven, Bridgeport, Waterbury, Torrington, Danbury and Manchester, Conn., and other associations from New Hampshire, Rhode Island and other States were present. One of the important matters discussed was that of securing representation by manufacturers on the shipping wage adjustment. It was voted to send the following telegram:

Charles N. Piez, Chairman, Emergency Fleet Corporation, Washington:

The following associations representative of New England industry gathered in conference urge upon you the absolute necessity for the appointment of a representative manufacturer as third member to the vacant position now existing on the Shipping Wage Adjustment Board. The announced conditions and marked increase of pay serve only to increase the chaotic conditions now existing in the metal and allied trades throughout the country. We emphasize that immediate action is imperative.

It was also voted to ask the New England Senators and Representatives to vote for the bill now under consideration by the House of Representatives which will permit the payment of excess profit and income taxes in installments on June 15, Aug. 15, Oct. 15 and Dec. 15, 1918, in place of one payment in June. A largely attended meeting in the evening was given over to the discussion of war topics and patriotic addresses.

Rails and Rolling Stock for Canadian Lines

TORONTO, Ontario, March 18.—An order for 100,000 tons of steel rails, or enough to lay tracks on some 800 miles of railroad, has been placed by Hon. J. D. Reid, Canadian minister of railways, on behalf of the Government, with the Dominion Iron & Steel Co. The rails are to be manufactured at the company's plant at Sydney, N. S., and all are to be delivered by the end of July next. Rolling will begin on April 1, and it is hoped that during April 10,000 tons can be ready for use in making replacements on Canadian railways. In May, June and July it is expected that the rail mill will be producing up to its full capacity and that deliveries will reach 30,000 tons a month. The rails will be 85 lb. and will be suitable for renewals on railway main lines. A couple of weeks ago arrangements were completed for supplies of rails sufficient to meet the requirements for the present year for renewals on the Canadian Government railways and the Canadian Northern system. The filling of the order placed with the Dominion Iron & Steel Co. will create a supply large enough to provide for rail replacements on the Canadian Pacific and Grand Trunk systems as well.

The minister of railways is arranging for new rolling stock, locomotives and rails for Canadian railways this year, aggregating a total cost of $40,000,000. He is ordering 7500 freight cars, 150 locomotives and several hundred new colonist sleepers, as well as other passenger cars.

Chicago Metal Trades Re-elects Officers

The Chicago branch of the National Metal Trades Association held its annual dinner March 14 with a larger attendance than ever before at a similar gathering. Officers were re-elected for the ensuing year as follows: President, O. A. Olson, Simonds Mfg. Co.; vice-president, G. A. Roth, Roth Bros.; treasurer, William Ganschow, William Ganschow Co., and secretary, Paul Blatchford. The members were addressed by S. J. Duncan-Clark, war analyst of the *Chicago Evening Post*, and a few remarks made by John W. O'Leary, of the Arthur J. O'Leary & Son Co., former president of the Chicago Association of Commerce, who has been mentioned as the next president of the National Metal Trades Association.

PERSONAL

The Emperor of Japan has conferred the decoration of the Second Order of the Sacred Treasure upon Judge Elbert H. Gary, chairman United States Steel Corporation. Decorations were also conferred upon ex-Mayor Mitchel of New York and ex-Mayor Curley of Boston. The action of the Emperor was taken to show his appreciation of the hospitality extended to the Japanese Mission headed by Viscount Ishii which visited the United States a few months ago.

S. H. Widdicombe of the New York office of Lewis F. Shoemaker & Co. has been placed in charge of the Washington office of that company in the Munsey Building.

C. J. Wolfe has resigned as manager of the New York office of the United Smelting & Aluminum Co., New Haven, Conn. Benjamin S. Rosenberg, for a number of years connected with Eagle Smelting & Refining Works, Nassau Smelting & Refining Works and Post van der Burg & Co., has been appointed to succeed Mr. Wolfe.

James L. O'Neill, for 22 years connected with the Carnegie Steel Co., Pittsburgh, and for five years its credit manager, has resigned to accept a responsible position with the Guaranty Trust Co. of New York. Mr. O'Neill expects to assume his new duties about May 1.

At a recent meeting of the directors of the Judson Mfg. Co., San Francisco, A. D. Shepard handed in his resignation as vice-president. It was accepted and Mr. Shepard severed his connections with the company. In his place W. D. Bunker, formerly general manager of the company, was elected vice-president and also continued in the office of general manager, in charge of both the factory and the San Francisco office. Most of his time will be spent in the San Francisco office.

Victor E. Edwards, vice-president Morgan Construction Co., Worcester, Mass., has become a consulting engineer for the Ordnance Department and is stationed at the Ordnance Proving Grounds, Aberdeen, Md. He will retain his position with the Morgan Construction Co., but will give his entire time to the work of the Ordnance Department. Mr. Edwards is widely known for his inventions, most of which have been on rolling mill machinery, notably mechanical cooling beds and flying shears.

Col. Jay E. Hoffer has been ordered by the War Department to assume command of the United States Armory, Springfield, Mass. Colonel Hoffer was graduated from West Point in 1892 and was stationed at the armory for three years, from 1903 to 1906.

Fred C. Avery, vice-president and general manager the Long & Allstatter Co., Hamilton, Ohio, has been elected vice-president and director of the Manufacturers' Association of Hamilton.

P. Leibrandt Weimer, assistant manager of the Weimer Machine Works, Lebanon, Pa., will leave for Washington soon to enter the Ordnance Department as a civilian inspector of cannon. Mr. Weimer is a graduate of the engineering department of the University of Pennsylvania.

Edward T. Stotesbury has been re-elected president of the Temple Iron Co., Reading, Pa., the organization continuing, although the company is inactive at present. Other directors who were elected include E. B. Thomas, W. H. Truesdale, F. D. Underwood, E. E. Loomis, Isaac Hiester, Frank C. Smink, W. J. Richards and Robert F. Deforest.

Landers Sevier, who succeeds J. W. McQueen as vice-president of the Sloss-Sheffield Steel & Iron Co., has spent his life in railroad work. He entered the service of the Southern Railway at Birmingham as rate clerk in 1887 and has been with that system exclusively except for a period of two years' service with the Seaboard. His latest office, that of executive agent of the Southern system, he resigned to go with the Sloss-Scheffield company. Mr. Sevier will, it is understood, devote special attention to transportation, relieving Mr. McQueen of that duty.

E. M. Kilby, vice-president of the Kilby Frog & Switch Co., Birmingham, Ala., has been elected president of the National Steel Products Co., which has planned the establishing of a plant in Birmingham. Mr. Kilby has made a success in frog and switch manufacturing and will not sever connection with the Kilby company.

Arthur J. Simonds has resigned as superintendent of the Noble & Westbrook Mfg. Co., Hartford, Conn., to enlist in the United States Naval Reserves as a machinist's mate, first class. A complimentary banquet was given in his honor by officers of the company and by factory associates, March 9.

C. R. Boas, formerly engaged as engineer at the plant of the New Jersey Zinc Co., Franklin, N. J., is now second-lieutenant with the American engineers in France.

T. H. Fatzinger has been elected secretary and H. J. Mack treasurer of the Bethlehem Securities Co., South Bethlehem, Pa., in which the Bethlehem Steel Co. is interested. The company furnishes second mortgages to workmen who build homes.

Earl E. Adams, lately sales manager, powdered coal department, Bonnot Co., Canton, Ohio, and for some years in charge of gas producer work for the Power & Mining Machinery Co., has accepted a position as sales engineer for the Smith Gas Engineering Co. and will shortly be located at Dayton, Ohio, where the new plant of the latter company is nearing completion.

James P. Armel has been appointed a senior inspector with the Aviation Section of the Signal Corps, and is in charge of inspection at the plant of the Bristol Co., Waterbury, Conn. For two years he had been with the Pittsburgh Valve Foundry & Construction Co. as engineer on special design estimates.

William T. Price has become president of the P-R Engine Co., Inc., New York, and second vice-president of the Rathbun-Jones Engineering Co., Toledo, Ohio. As announced in this column on Nov. 29, Mr. Price resigned as manager and chief engineer of the oil engine department of the De La Vergne Machine Co. to develop the manufacture of an oil engine of his own design, having established the Price Engine Corporation, under licenses from which the Rathbun-Jones company will manufacture the engine and the P-R company will distribute it. The main office of this last mentioned company is at 110 West Fortieth Street, New York. In the Price-Rathbun engine a new principle of fuel injection is employed.

Walter D. Munroe, formerly with the city sales force of the Jos. T. Ryerson & Sons Co., Chicago, has been made manager of the Pittsburgh office in the Oliver Building, succeeding Ward A. Miller, who resigned, and is now connected with the Ordnance Department at Washington.

Harry Stambaugh, formerly with the Wm. Tod Co., Youngstown, Ohio, has been made assistant treasurer of the Republic Rubber Co., Youngstown, and A. L. Irish has been elected assistant secretary. Former officers of the Republic Rubber Co. have been re-elected with the exception of Chairman Thomas L. Robinson, who is abroad, and it was decided for the present not to elect a chairman.

H. F. Finney, who formerly represented the Chicago and St. Louis territories of the Independent Pneumatic Tool Co., Chicago, manufacturer of pneumatic tubes and electric drills, has been placed in charge of the company's branch office, Farmers' National Bank Building, Pittsburgh. He succeeds R. T. Scott, who has been promoted to the office of Eastern manager, with headquarters at 170 Broadway, New York. Mr. Scott succeeds R. S. Cooper, formerly

manager of the New York office, who has been made vice-president and general sales manager, with headquarters in Chicago.

A. W. Calloway, president of the Davis Coal & Coke Co., Baltimore, and of the Terminal Railroad & Coal Co., Pittsburgh, has been appointed director of the bituminous coal distribution by Fuel Administrator Garfield. In the distribution, Mr. Calloway will have competent coal salesmen and shippers in charge of the various subdivisions of his work.

A. B. Morrison, Jr., has recently accepted a position with the Smith Gas Engineering Co., Dayton, Ohio, as sales engineer. Mr. Morrison was formerly with the Fort Wayne Electric Works and the Rathbun-Jones Engineering Co. and more recently with the John H. McGowan Co. as Philadelphia representative.

G. F. Mitchell, who has been assistant structural sales agent in the Philadelphia office of the Bethlehem Steel Co., has left to enter the structural steel department of Morris, Wheeler & Co., Philadelphia.

A. G. Ueberroth, former works accountant at the Steelton plant of the Bethlehem Steel Co., has been promoted to chief works accountant for all the Bethlehem plants at Bethlehem, Pa.

A. F. Ausman, formerly vice-president of the McMaster-Carr Supply Co., Chicago, has withdrawn from that company and accepted the position of district manager of the Nagle Corliss Engine Works, Erie, Pa., with offices in the Monadnock Block, Chicago. This gives direct representation from the Erie plant to the Chicago district for air compressors, vacuum pumps and Corliss engines manufactured by the Nagle Corliss Engine Works.

J. Henock, 32 Broadway, New York, is about to go to Australia as representative of a number of American manufacturers of machinery and tools.

Harry D. Sarge, formerly connected with the merchandise sales department of the Bethlehem Steel Co., Lebanon, Pa., has resigned, and has been appointed assistant treasurer of the Superior Steel Corporation, Union Arcade Bldg., Pittsburgh, effective from March 18.

At the annual meeting of stockholders and directors of the Valley Mould & Iron Co., Sharpsville, Pa., held in New York Tuesday, March 12, George H. Boyd, president, resigned and was made chairman of the board. John E. Perry, formerly president of the Wharton Steel Co., was elected president to succeed Mr. Boyd. Floyd K. Smith, for many years general manager, resigned recently and is now in California. He has been elected vice-president of the Donner Steel Co., Buffalo.

Charles T. Mason has been appointed assistant general superintendent of the Joliet works of the Illinois Steel Co. J. H. Walsh has been appointed by the same company as superintendent of rolling mills at its South works.

H. G. Uphouse has been appointed Philadelphia manager of sales by the Donner Steel Co., Buffalo, whose Philadelphia office is in the Morris Building.

Official confirmation has been received that the plant of the Superior Portland Cement Co. near Ironton, Ohio, will be put in operation at an early date. The property was recently purchased by S. E. Stephenson and Lieut. M. L. Stephenson, as trustees for the Wellston Iron Furnace Co., and will be operated by that company. Executive offices will be maintained at Jackson, Ohio. The plant has a capacity of about 2000 bbl. of Portland cement per day and is expected to be in operation before May 1. The cement will be marketed under the former name of Superior.

For highway improvement in 1918 a total of $263,096,000 is to be spent by the combined forces of the Federal Government and the States and counties, according to a survey made by the B. F. Goodrich Rubber Co. These expenditures thus promise to be 82 per cent more than those of 1917.

OBITUARY

ELISHA J. STEELE, who retired in 1916 from his position as vice-president of the American Brass Co., after 41 years of service, died, March 10, at his home in Torrington, Conn. Mr. Steele was born in Torrington, June 29, 1843. At the age of 12 he entered the factory of Wadhams & Webster, of which his father was superintendent. In 1859 he entered the employ of what is now the Union Hardware Co., remaining there until the Civil War, when he enlisted and served with a notable record for four years. Returning to Torrington, he was employed by Turner & Clark, remaining with them until 1875, when he accepted a position as superintendent of the brass department of the Coe Brass Co. When the Coe Brass Co. was merged with the American Brass Co. Mr. Steele was made superintendent of the Coe branch. Afterward he became assistant secretary, secretary-treasurer, and in 1913, vice-president. He was prominent in the Grand Army of the Republic and in numerous church and charitable organizations.

ISAAC STEPHENSON, former United States Senator, who died at his home, Marinette, Wis., March 16, aged 88 years, although principally interested in lumber, had a considerable investment in mining and blast furnace properties. The Stephenson mine at Gwinn, Mich., on one of his properties, is now being operated by the Cleveland-Cliffs Iron Co., Cleveland. He was a large stockholder in the Stephenson Charcoal Iron Co., Marquette, Mich., with stack at Wells, Mich., which he organized in 1911. Grant T. Stephenson, a son and the only surviving child, now a lieutenant in the Navy, is vice-president of the Stephenson Charcoal Iron Co.

FRANK J. HURLEY died at the home of his parents in East Orange, N. J., Sunday, March 10, after a long illness. He was well known in the pneumatic tool field, having traveled for a number of years out of the New York office of the Independent Pneumatic Tool Co., Chicago. Mr. Hurley was 29 years old.

British Women in Munitions and Other Shops

British women employed in munitions work, according to the *Labor Gazette*, numbered about 700,000 last October, with 650,000 women in other industrial work. In addition there were some 40,000 women employed in work in government commercial occupations and transport. The increase in the occupations for which employers' returns are received does not represent the net increase in the number of women employed in all occupations, since domestic servants and women employed in very small workshops and workrooms in the dressmaking trade are excluded, as well as women at work in military, naval and Red Cross hospitals. Under the last head, there has been an increase in the number of women employed equal to 43,000 full-time workers, in addition to which a few thousand women are employed in the Women's Army Auxiliary Corps. On the other hand, it is estimated that there has been a displacement of 40,000 women from small workshops and domestic service. Taking these figures together, the net result gives an increase of about 1,070,000 women employed in occupations outside their own homes. According to the same returns, about 1,413,000 women, excluding casual agricultural laborers, are directly replacing men, the largest number being in industrial and commercial occupations. There has been a slackening off in the expansion of women's employment in the metal trades.

Crocker Brothers, New York, iron and steel merchants, now located in the Forty-second Street Building, 30 East Forty-second Street, have leased an entire floor in the new office building now being completed at Fortieth Street and Madison Avenue for new offices.

NEW FERROMANGANESE SUPPLY

To Be Made in Montana, Releasing Ten Ships in Brazilian Trade

Further facts are now available relative to the plans of the Anaconda Copper Mining Co. for producing ferromanganese electrolytically at Great Falls, Mont., as referred to in these columns on March 7. The appeal of the War Industries Board to John D. Ryan, the company's president, to aid in increasing the ferromanganese output of the country led to active work by the Anaconda Company's staff, and it is now announced that within about five months ferromanganese manufacture will be under way in electric furnaces, current being derived from the Montana Power Co. It is expected that eventually an output of 30,000 tons a year of 80 per cent ferromanganese will be reached. Rhodochrosite, a carbonate of manganese, will be the principal ore used, though rhodenite, a silicate, will also be mined from the Anaconda and other deposits in the Great Falls district.

To Release Ten Ships in Brazil Trade

Secretary of Interior Lane announced March 18 that the Anaconda Copper Mining Co. of Montana was entering into the ferromanganese business. John D. Ryan in a letter to Secretary Lane says:

"In ordinary times these ores would have no value, and to transport them in the raw state and manufacture the ferromanganese in the East, even under war conditions, is impracticable on account of the cost, shortage and difficulties of transportation. To manufacture these low grade ores into an 80 per cent ferromanganese product within a very short distance of where they are produced, by the use of hydro-electric power that is available, without taking it from any other use, seems to me in itself is a matter of much interest in these times; but the greatest accomplishment in doing this will be the release of the equivalent of ten ships of 5000 tons each now used in bringing manganese from Brazil. These ships can, even under war conditions, providing none of them is lost, carry 300,000 tons of food and material annually from our Atlantic ports to Europe.

"The Anaconda Copper Mining Co. will equip and operate the plant, the installation of which can be accomplished quickly by the use of buildings which the Anaconda company has available, and which are equipped with cranes, tracks and facilities that would take a long time to provide, if they had to be constructed specially. We think it can be put in operation in about four and a half months.

"The power is available from the Holter Development, completed within a month by the Montana Power Co., as a reserve and in advance of its market requirements. This plant is capable of furnishing 40,000 kw., 24-hr. daily the year round.

"The manganese plant will be constructed in Great Falls in the buildings and yards of the present smelter of the Anaconda company there, and the ores will, as I said above, be produced from the Butte mines."

The Butte Copper & Zinc Co., of Butte, has recently sold manganese ore to the United States Steel Corporation and to the Miami Metals Co., Chicago. This is said to be a concentrate of about 37 per cent manganese and 10 per cent silica, a reduction of the silica from 45 per cent.

L. Birkenstein to Head Salvage Bureau

The National Association of Waste Material Dealers opened its annual convention at the Hotel Astor, New York, on Tuesday. It was announced that Louis Birkenstein, who has been president of the association for several years, will tender his resignation to accept an appointment in Washington, where he will be in charge of the Salvage Bureau of the Reclamation Division of the Quartermaster's Department of the War Department. Mr. Birkenstein, who is head of the firm of S. Birkenstein & Sons, New York and Chicago, will retire from active business to give his full time to the Salvage Bureau.

Wages of Sheet and Tin Plate Mill Men Reduced

The regular bi-monthly settlement of sheet and tin mill wages was held in Youngstown, Ohio, last week. Sheet and tin plate mills that sign the Amalgamated Association scales were represented by A. M. Flora of the Trumbull Steel Co. and James H. Nutt of Youngstown. It was found that the average price on Nos. 26, 27 and 28 gage black sheets shipped out by the mills in January and February was 5.35c., a reduction of 15c. per 100 lb. below the average price in January and February. This means that wages of sheet mill hands for March and April will be reduced three points, or 4½ per cent, as compared with wages for January and February. The largest reduction falls on the roller, whose earnings for many months have been very high. This is the first reduction suffered by the sheet mill hands for many months. Wages for January and February were 100½ per cent higher than the base of the scale, while for March and April they will be 96 per cent higher. It was found that the average price on shipments of tin plate in January and February per base box was $8.40, a reduction of 20c. per base box over the January and February price, which was $8.60. This reduction of 20c. per base box means that wages of tin mill hands governed by the scale will be four per cent lower in March and April than in January and February, and, like in sheets, the heaviest reduction in wages will affect the rollers. In January and February, wages of tin mill hands were 102 per cent above the base of the scale, while for March and April they will be 98 per cent above the base. It is likely that when the next settlement of wages of sheets and tin mill hands for April and May is made sheet and tin mill workers will have to accept another reduction, as prices on sheets and tin plates are steadily getting nearer those fixed by the Government, these being 5c. per lb. on No. 28 gage black sheets, and $7.75 per base box on tin plate, rolled from Bessemer or open-hearth stock.

Causes of Recent Strikes

Increased cost of living and failure of employers in many cases to anticipate this influence have been among the important contributory causes of recent strikes, according to a report issued March 12 by the National Industrial Conference Board on strikes in American industries in wartime.

From April 6 to Oct. 6, 1917, there were strikes at 2521 establishments, the existence of which was definitely verified by the board. Each establishment was asked to report upon causes, but complete information was received from only 1156. These plants showed 283,402 men idle and 6,285,519 days of production lost.

The conclusions of the board as to the causes of the unsettled condition of labor are that the following influences were of primary importance:

"Increased cost of living and failure of employers in many cases to anticipate this influence.

"Widespread discontent due to a belief that undue profits had been made by employers out of war business.

"Increased independence of the worker, due in part to a labor shortage and in part to a feeling that the situation constituted labor's opportunity for forcing union recognition or closed shop conditions.

"Inequality between wages paid in plants engaged on private work and Government or private plants engaged on war work.

"The unsettling influence of the 'cost-plus-profit' feature of many war contracts.

"The Federal Administration's virtual indorsement of the eight-hour work day."

The report concludes:

"Indications of improvement in the labor situation in recent months are apparent, but it needs only a cursory reading of the daily press to see that the war industries of this country are still heavily handicapped by labor disputes."

Machinery Markets and News of the Works

NEW ORDNANCE PROGRAM

Government to Give Out Big Contracts

Machine Tool Builders Keep Representatives in Washington in Anticipation of Inquiries

Reports are current in the machinery trade that the new program of the Ordnance Bureau of the War Department, involving contracts for guns and munitions aggregating hundreds of millions of dollars, and covering war preparations for 1919, will take definite form very soon in Washington, where the plans have been in process of formulation for some time. The new program will be the largest of any that has yet been launched by the Government and, as previously indicated, it will create new demands upon the machine tool industry exceeding any that have yet been made known. Many machine-tool builders have had their representatives in Washington for several weeks in anticipation of the forthcoming inquiries for equipment.

Except in very large tools, deliveries on priority order are showing a marked improvement. Turret lathes are to be had in one to three months, engine lathes in about the same period, while some small machines may be had out of stock. Prices of standard tools show no change, but less is being heard of second hands exacting large bonuses for new tools for prompt delivery.

Buying for war needs abroad has been a feature of the New York market. Large orders were placed by the French High Commission for aviation work in France; Lancia & Co. are buying through their New York representative for aviation motor work in Italy; the Pennsylvania Railroad Co. continues to buy for the American military railroad in France; the J. G. White Engineering Corporation, New York, is making purchases for the use of the United States Signal Corps in France. The Fiat-San Giorgio Co., Ltd., of Italy, whose representative is in New York, will buy a great deal of equipment for a large shipyard and engine works in Italy. The company is a subsidiary of Gio Ansaldo & Co. Its purchases in this country may eventually total $5,000,000. Frank C. Roberts & Co., Philadelphia, will make large purchases of cranes and other equipment for a steel plant in Spain.

The Chester Shipbuilding Co., Chester, Pa., has issued a list of 71 miscellaneous machines and tools it will buy. The National Cash Register Co., Dayton, Ohio, has bought 70 lathes in the East and, according to report, will engage in the manufacture of airplanes and motors. The Colt's Patent Firearms Mfg. Co., Hartford, Conn., has placed a substantial order for tools for making the heavy type of Browning guns. Inquiry is expected soon from the Marlin-Rockwell Corporation, New Haven, Conn., and the New England Westinghouse Co., Springfield, Mass., though the latter's purchases may not be large. Paymaster General McGowan of the Navy Department is asking for bids on 29 tools. The Vulcan Iron Works, Jersey City, N. J., will buy new equipment for the manufacture of marine engines for the Emergency Fleet Corporation. The International Motor Co., Plainfield, N. J., will buy about 50 tools for building motor trucks and motors.

New crane business is in small volume compared with the records established last year. Several new shipbuilding projects in the East give promise of additional business when their plans have been fully completed.

In Chicago there is no great activity in machine tools, though manufacturers have been requested by the Government to figure on increasing their output of shells and other munitions, and this may result in new business soon. The Winslow Brothers Co., Chicago, will double its equipment for making 155-mm. shells.

The Erie Forge Co., Erie, Pa., has sent a small inquiry to the Cleveland market.

In Pittsburgh an inquiry is expected soon from the Westinghouse Electric & Mfg. Co., which has taken a large Government order for forgings. The General Electric Co. is inquiring in Pittsburgh for nine cranes, ranging from 5 to 15 tons, for its Erie, Pa., works.

New York

NEW YORK, March 19.

Buying for war needs abroad has been a feature of the New York machine-tool trade during the past week. The largest buyer was the French High Commission, which placed orders for several hundred tools for aviation work in France.

A prospective buyer whose purchases may total about $5,000,000 is the Fiat-San Giorgio Co., Ltd., a subsidiary of Gio Ansaldo & Co. Ivo Schiavon, the company's representative, is in New York with lists of about 200 machines of various types, which will be supplemented later. The prospective purchases include hydraulic equipment, plate shop machinery, machine tools, and cranes. Raw materials will also be bought here. The company has expanded its capital to 22,000,000 lira, has acquired the Italian Westinghouse plant and one of the Fiat factories and is at present building submarines and other war equipment for the Italian Government. Its contemplated expansion will include five shipways for the construction of 18 standard cargo-carrying vessels within one year from next October, together with engines and other equipment for these ships. On a considerable part of its equipment, six months' deliveries are required, but bids on the following tools for prompt delivery are requested: 30 vertical or horizontal milling cutters, longitudinal stroke, 850 mm., vertical stroke, 400 mm. as a minimum; five universal grinders, 10x60 in.; two horizontal boring machines, longitudinal stroke, 1500 mm., vertical stroke, 500 mm.; 10 Colburn drilling machines of the type N.D. 8 or their equivalent, and 30 upright drilling machines.

Another buyer for shipment to Italy is Lancia & Co., represented by Thomas Everett Adams, 755 Fifth Avenue, New York, who require tools for the manufacture of aviation motors in their Italian factory.

The Pennsylvania Railroad Co. continues to buy from its Philadelphia purchasing office for shipment to the American military railroad in France, its latest inquiry calling for 12 36-in. boring machines.

Frank C. Roberts & Co., Real Estate Trust Building, Philadelphia, have received bids for several million dollars' worth of equipment for the new Soria & Azner steel plant in Spain. Fifty cranes were included in the list of machinery to be bought.

The J. G. White Engineering Corporation, New York, is making additional purchases of tools for the use of the United States Signal Corps in airplane manufacture in France.

The Chester Shipbuilding Co., Chester, Pa., on Monday issued a list of 71 miscellaneous machines and tools for its shipyard, among them being the following: One 50-ton forcing press, two power hack saws, one hardening furnace, one 350-ton bar shear, one heavy duty forging machine, three heavy duty lathes, three turret lathes, one vertical boring machine, one double head planer, one shaper, one sensitive drill press, one universal radial drill, one 85-ton hydraulic coil bending press, seven sets of roll tables, pipe machines, milling machines, punches and other machines.

The Simplex plant of the Wright-Martin Aircraft Corporation, New Brunswick, N. J., which inquired last week for nearly 500 tools, has received quotations and a representative went to Washington a few days ago to show to officials there the deliveries that are obtainable. The prospective contract of the Wright-Martin plant is for a large number of Hispano-Suiza aviation motors of 400 hp. The motor at present being built is 150 hp. Another company which is figuring on aviation motor work is the Pusey & Jones Co., Philadelphia, whose plant is at Wilmington, Del.

The National Cash Register Co., Dayton, Ohio, will engage in the manufacture of complete airplanes, according to report here. An Eastern factory has received an order for about 70 lathes and other equipment has been bought from a Cleveland machinery house. The company's metal-working and wood-working departments are being considerably enlarged.

The Colt's Patent Firearms Mfg. Co., Hartford, Conn., placed a substantial order last week for additional equipment for the manufacture of the heavy type Browning machine guns. The Marlin-Rockwell Corporation, New Haven, Conn., will be in the market soon for additional requirements. A new factory is being completed in which the light type of Browning guns will be made. The Standard Roller Bearing Co. plant of the Marlin-Rockwell Corporation in Philadelphia may also be diverted to the manufacture of Browning guns or parts. The New England Westinghouse Co., Springfield, Mass., is reported to be figuring upon additional equipment, although the factory is already well equipped for its new Browning gun contract.

Paymaster McGowan of the Navy Department is asking for bids on 29 machine tools for various navy yards, these including drills, grinders, engine lathes, boring mills and shapers.

The Vulcan Iron Works, Jersey City, has received a contract from the Emergency Fleet Corporation for marine engines and will purchase a considerable number of machine tools for a new extension to its plant. It has placed an order with the Northern Engineering Co., Detroit, for three 15-ton shop cranes.

The International Motor Co., Plainfield, N. J., has bought a few tools and will buy about 50 more for the manufacture of motor trucks and motors.

Army transports are being fitted out with small machine shops, consisting of a lathe, a shaper and a drill. Orders for these tools have been placed in New York by the paymasters of the vessels.

A source of prospective business for builders of boring machines and turret lathes is the manufacture of a standard type of malleable iron wheel for army motor trucks. The Government has purchased manufacturing rights from a Syracuse, N. Y., company and a number of manufacturers will engage in making them. There is a small amount of machining on each wheel.

Crane business is only fairly active. A number of manufacturers could take on considerable business and are anxiously seeking it. Deliveries have improved, so that it is now possible to obtain cranes in from three to four months, and in some instances even this can be bettered. Some of the crane companies are behind on orders taken some time ago. A large shipbuilding company is being seriously embarrassed in its preparations for actual work on ships by the fact that deliveries are months behind on a large crane order it placed last year. Delays in obtaining steel and motors have been the principal factors in failure to meet delivery schedules.

The Pennsylvania Railroad Co. is in the market for one 5-ton, 3-motor crane with a 2-yd. bucket and a 10-ton, 3-motor crane, 50-ft. span. The Dupont Engineering Co., Wilmington, Del., will buy a number of hoists and may come into the market for a power house crane for the Government powder plant at Nashville, Tenn., which it is building. The Stone & Webster Engineering Co., Boston, wants a coal-handling crane with a one or two yard bucket for the General Electric Co. plant at Buffalo, N. Y. The Shaw Electric Crane Co. has received orders for two 10-ton cranes, 72 and 80-ft. spans, for the Harrison, N. J., works of the Worthington Pump & Machinery Corporation and two 15-ton cranes, 46-ft. span each, for the Holyoke, Mass., works of the same corporation. The Tindel-Morris Co., Eddystone, Pa., has bought a 60-ton and two 10-ton cranes. The Bullard Machine Tool Co., Bridgeport, Conn., has bought a 5-ton crane and two small hoists. The Merchant Shipbuilding Corporation, Bristol, Pa., is receiving bids on four cranes.

New shipbuilding activities continue to develop. The Weehawken Dry Docks Co., Weehawken, N. J., has purchased a site of more than 700 acres of land near Peekskill, N. Y., on the east bank of the Hudson River, and will, it is reported, expend about $4,000,000 for a shipyard. The company is said to have practically concluded arrangements with the Emergency Fleet Corporation for 14 steel ships of 7500 tons, 12 concrete vessels of 3500 tons and 100 barges. The Continental Shipbuilding Co., Selah Masten, president, has opened an office at 103 Park Avenue, New York, and will be in the market in a month or six weeks for equipment for a new steel shipyard at Yonkers, N. Y. The company already owns a shipyard there which is engaged in building wood and concrete vessels. The Ferro-Concrete Shipbuilding Corporation, 149 Broadway, New York, and the Fougner American Steel Concrete Shipbuilding Co., 18 East Forty-first Street, New York, will establish shipyards in the East for the construction of concrete vessels for the Emergency Fleet Corporation.

The Newark Die Co., New York, has been incorporated with a capital of $15,000 by E. A. Barth, E. Hemming and T. Stave, 30 Church Street.

The M. J. Ford Mfg. Co., New York, has been incorporated with a capital of $20,000, by B. W. Tucker, M. J. Ford and I. Goldberg, 62 East Tenth Street, to manufacture lock-joint tubing, etc.

The Columbia Bronze Corporation, Freeport, Long Island, has awarded contract for the erection of an addition to its works on North Main Street, to cost about $15,000.

R. Merrel's Sons, New York, have filed articles of incorporation with a capital of $10,000 to manufacture nautical instruments. B. H. Mautner and R. Shiller, 60 Wall Street, are the incorporators.

The American Condenser & Engineering Co., New York, has been incorporated in Delaware with a capital of $500,000, to manufacture power plant equipment. C. E. Balm, New York; G. T. Commet, White Plains; and R. Condit, Yonkers, N. Y., are the incorporators.

David J. Conroy, Inc., New York, has been incorporated in Delaware, with a capital of $100,000, to operate a boat-building plant. James A. Martin, George V. A. McCloskey and Oscar E. Jackson, all of New York, are the incorporators.

The Williams Harvey Corporation, Mill Basin, Jamaica Bay, Long Island, is planning the early operation of the first unit of its tin-smelting plant now in course of erection. It will be one story, 120 x 250 ft., and will be augmented by two additional units.

The Ransome Concrete Machinery Co., Dunellen, N. J., manufacturer of concrete mixers, etc., has been merged with the Oshkosh Mfg. Co., Oshkosh, Wis., under the name of the Ransome-Leach Co., with executive offices at 115 Broadway, New York.

The Richard & Boynton Co., Dover, N. J., manufacturer of furnaces, etc., has resumed operations at its plate works, which have been closed since December. The plant gives employment to about 100 men.

The Robert Gilchrist Co., foot of Livingston Street, Elizabeth, N. J., manufacturer of manganese dioxide carbon, has increased its capital from $25,000 to $175,000.

Construction work is being rushed on a large four-story reinforced-concrete plant addition to the Saurer works of the International Motor Co., 252 West Sixty-fourth Street, New York, at Plainfield, N. J., to cost about $200,000. It is reported that lack of housing facilities for workmen at Allentown forced the company to forego plans for adding this new capacity to its Mack works.

The Weehawken Dry Dock Co., Weehawken, N. J., operating a plant at the foot of Baldwin Street for boat-building, has acquired about 760 acres at Verplank's Point, Peekskill, N. Y., formerly owned by the Hudson River Brick Mfg. Co., the C. I. Bleakley Co., and others. The site will be used for a shipbuilding plant to cost about $3,000,000, to be equipped for the construction of steel, concrete and wooden ships. The company is reported to have orders for fourteen 7500-ton steel vessels, twelve 3500-ton concrete ships, and 100 barges. These vessels will all be constructed at the new works. Richard B. Rodermound is general manager.

F. Ferguson & Son, 1122 Clinton Street, Hoboken, N. J., operating a foundry for the manufacture of grate bars, propeller wheels, etc., will build a one-story addition, 50 x 130 ft., on Grand Street.

The W. & A. Fletcher Co., 1301 Hudson Street, Hoboken, N. J., manufacturer of marine engines, boilers, etc., has

filed plans for the erection of a three-story brick addition to cost about $38,400.

The initial works to be erected by Henry Ford on the meadows near Jersey City, N. J., for the construction of submarine chasers, will consist of five buildings, comprising a fabricating shop, a fitting-out shop and three assembling plants. It is said that construction will be rushed to allow for active production by June. The plant, estimated to cost $1,000,000, will adjoin the works of the Ford Automobile Co., and will be in the immediate vicinity of the plants of the Federal Shipbuilding Co. and the Foundation Co.

The United Tool & Die Co., Newark, has been incorporated with a capital of $25,000 by Frederick Bollinger and Richard Enderwood, Newark, and Gebhard Holenstein, West Orange.

The Acme Newark Machine Works, 238-240 Astor Street, Newark, has filed notice of organization to manufacture machinery and tools. Edward Skerman, 20 Avon Street, and Clinton E. White, 29 Tichenor Street, Newark, and George J. Grossman, 1022 Grove Street, Irvington, are the incorporators.

The National Metal Stamping & Mfg. Co., 190 Murray Street, Newark, manufacturer of fire extinguishers, etc., will build a one-story brick and steel shop and foundry addition, 90 x 120 ft., to cost $20,000.

Fire March 10 destroyed part of a machine and pattern shop at the works of the A. & F. Brown Co., Third Street, Elizabeth, N. J., manufacturer of power transmission machinery.

The Pettinos Graphite Co., East Orange, N. J., has been incorporated with a capital of $10,000 by Charles E. Pettinos and George F. O'Neill, New York, and Edward J. Bruch, East Orange, to manufacture graphite specialties.

The Bockin Mfg. Co., Union Hill, N. J., has been incorporated with a capital of $10,000 by William Bockin, Charles McGarity, Bernard B. Neal and John McCallion, to manufacture firearms, ammunition, etc.

The Ordnance Department, Washington, is negotiating for property at Clay Street and Madison Avenue, fronting on the Erie Railroad, Paterson, N. J., for the construction of a plant of about 7 buildings for the use of the Ordnance and Quartermaster's departments. It is said that the plant will cost $2,000,000.

The National Air Cell Covering Co., Henderson Street and the Morris Canal, Jersey City, has filed plans for a one-story reinforced-concrete addition to cost $45,000.

The Olive Loading Co., Jersey City, has been incorporated with a capital of $500,000 to manufacture ammunition. T. A. Gillespie of the T. A. Gillespie Co., 50 Church Street, New York; T. H. Gillespie and R. L. Oliver are the incorporators.

The Lane Mfg. Co., East Orange, N. J., has been incorporated with a capital of $10,000 by Edward Morley, Newark, and William I. Lane, South Orange, to manufacture hydro-carbon burners.

The Essex Shear Co., Newark, N. J., has been incorporated with a capital of $30,000 by Theron A. Clements and Otto J. Korhummel.

The Cleveland-Osborne Co., Cleveland, manufacturer of foundry supplies, has leased additional space in the factory building at 103 Oliver Street, Newark, which it is now occupying in part.

The New Jersey Metal Box Co., Newark, has been organized to operate a plant at 61-65 New Jersey Railroad Avenue for the manufacture of metal boxes. Isidor F. Friedman, 92 Andrews Street, Bayonne, heads the company.

The Saugerties Foundry & Machine Co., New York, has been incorporated with a capital of $20,000 by E. North, F. C. Smith and G. W. Levett, 1 West Seventy-second Street.

The X. L. N. T. Improved Auto Plate Co., New York, has been incorporated with a capital of $10,000 by F. H. and J. B. Parcells, 84 Wall Street.

The National Lead Co., 111 Broadway, New York, is taking bids for the erection of a five-story addition, 50 x 120 ft., to its Atlantic Works, Marshall Street, Brooklyn.

The W. Irving Forge, Inc., New York, has been incorporated with a capital of $50,000 to manufacture metal goods, etc. R. C. Bullard, 510 Audubon Avenue, and W. L. Hoskins, Glenbrook, Conn., are the incorporators.

The Columbia Wood Tool Mfg. Co., New York, has been incorporated with a nominal capital of $5,000 by P. P. A. Meyn, O. Peters and W. M. Merressmith, 25 Broad Street.

Harry Hall, 229 West Tenth Street, New York, will make alterations in his one and two-story machine shop, about 90 x 170 ft., at a cost of $10,000.

The J. Sklar Mfg. Co., 133 Floyd Street, Brooklyn, manufacturer of surgical instruments, has increased its capital from $75,000 to $100,000.

The Coffey Springer Engineering Co., New York, has been incorporated with a capital of $10,000 to manufacture roofing products. F. M. King, H. D. Springer and J. A. Coffey, 2412 Seventh Avenue, are the incorporators.

The National Metal Ware Co., Brooklyn, has been incorporated with a capital of $15,000 by B. and J. Friedman, 1557 Union Avenue.

The James R. McMann Co., New York, has filed articles of incorporation with a capital of $30,000 to manufacture plumbers' supplies, sanitary fixtures, etc. A. A. Gulick, H. E. Mulliken and J. R. McMann, Englewood, N. J., are the incorporators.

The Rainer Motor Co., Bradley Street, Flushing, L. I., will build a one-story extension, 50 x 100 ft.

The S. P. Mills Co., Brooklyn, has been incorporated with a nominal capital of $5,000 to manufacture engines, boilers, etc. H. F. Klemens, C. P. Kramer and J. A. Lane, 30 Post Street, are the incorporators.

The Chromograph Corporation, New York, has been incorporated with a capital of $20,000 to manufacture projecting machines. R. Lynch, C. M. Schuler and G. Norris, 115 Broadway, are the incorporators.

The Gage Bar Lock Co., New York, has been incorporated with a capital of $20,000 by J. H. Rhodes, W. A. Fox and E. E. Gage, 56 Morningside Avenue.

The Columbia Aircraft Co., New York, has been incorporated in Delaware with a capital of $150,000 by Amos F. White, F. W. Ashurst and John M. P. Thatcher, New York.

The Alsop Triple Interior Corporation, New York, has been incorporated in Delaware with a capital of $250,000 to manufacture motors, engines, etc. Benjamin Fisher and Samuel Alsop, New York, are the incorporators.

The Ideal Tool & Machine Co., Poughkeepsie, N. Y., has increased its capital stock from $10,000 to $25,000.

Plans have been drawn for a factory and office building for the Triplex Safety Co., East Mount Vernon, N. Y., to cost $50,000.

The Genesee Motor Car Co., Utica, N. Y., has increased its capital stock from $5,000 to $100,000.

Buffalo

BUFFALO, March 18.

The Crouse-Hinds Co., Seventh, North and Wolf streets, Syracuse, manufacturer of electrical goods, has had plans prepared for a new two-story plant to cost about $100,000.

The Kelsey Heating Co., Manlius, N. Y., has increased its capital from $100,000 to $200,000.

The American Car & Foundry Co., Depew, N. Y., will build several additions to its local plant, consisting of one-story buildings, about 18 x 90 ft., and 30 x 60 ft.

The Jamestown Propeller Co., Falconer, N. Y., has been incorporated with a capital of $30,000 to manufacture propellers for aircraft, etc. A. L. Caelisch, F. J. Maurer and W. H. Alling, Jamestown, are the incorporators.

The Regal Motor Car Co., Detroit, Mich., is reported to be considering the construction of a new works at Jamestown, N. Y., for handling a Government order for 300,000 3-in. shells.

The Jamestown Wood Finishing Co., Jamestown, N. Y., will build a two-story factory, 35 x 100 ft., to cost $30,000.

Fire March 7 destroyed a portion of the plant of the Hard Mfg. Co., 117 Tonawanda Street, Buffalo, manufacturer of iron and brass beds, with loss estimated at $30,000.

A new power plant will be erected by the Crescent Tool Co. at its works on Harrison Street, Jamestown, N. Y.

Fire March 13 caused a loss of about $40,000 at the works of the Sterns Electric Equipment Co., 66 Broadway, Buffalo.

The Aldrich Mfg. Co., Buffalo, has been incorporated with a capital of $400,000 to manufacture brass, copper and other metal goods. Isaac A. Aldrich, Leo Wertheimer and Charles S. Hunt, 51 Illinois Street, are the incorporators.

The Marvel Oil Burner Co., Buffalo, has been incorporated with a capital of $200,000 by John H. McLean, 285 Delaware Avenue, and George B. Burt, 2449 Delaware Avenue, Buffalo, and L. R. Upton, East Aurora.

The Buffalo Nipple & Machine Co., Buffalo, is preparing plans for an addition to its factory at Glenwood Avenue and Dupont Street.

Contract has been awarded by the Ferguson Steel & Iron Works, Buffalo, for the construction of a machine shop at its plant at Greene and Stanley streets and the New York Central Railroad.

The Swan & Finch Co., 416 Tracey Street, Syracuse,

N. Y., will erect a boiler house at a cost of about $5,000.

The J. H. Williams Co., Buffalo, manufacturer of drop forgings, has let contract for erection of an additional building, 75 x 200 ft., two stories, of reinforced concrete and brick, to cost $75,000, at its plant, Vulcan Street and the New York Central Railroad.

The Pullman Car Co. has let contract to the Arnold Co., Chicago, for additional repair shop buildings, of steel and brick construction, for its car repair plant at Broadway and the New York Central Railroad, Buffalo.

The Hilliard Clutch & Machine Co., Elmira, N. Y., is receiving bids for erection of a one-story addition, 33 x 144 ft., to its factory on Fourth Street and Railroad Avenue to cost about $25,000.

Bids are being received for a machine and forge shop, 60 x 115 ft., one story, of concrete and brick, to be erected on Norton Street, Rochester, by the High Speed Hammer Co., 307 St. Paul Street, estimated to cost $25,000.

The Wheeler-Greene Electric Co., 31 St. Paul Street, Rochester, will build extensive additions to its plant and has increased its capital stock from $100,000 to $500,000 for that purpose.

The Three Rivers Machine, Tool & Die Corporation, Phoenix, N. Y., has been incorporated with a capital stock of $30,000 to take over the plant and business of the Oswego Machine, Tool & Die Works. The officers of the new company are Maxwell R. Karge, president; Charles F. Loomis, secretary and treasurer.

New England

BOSTON, March 18.

The Remington Arms Union Metallic Cartridge Co., Bridgeport, Conn., has awarded a contract for an addition, to one of its buildings at its cartridge plant, of another story, 61x417 ft.

The New England Watch Co., Waterbury, Conn., is to build two additions; 10x53 ft., with ell, 20x31 ft., four stories, and 32x48 ft., one story. These additions are principally to give additional sanitary facilities.

The Bullard Machine Tool Co., Bridgeport, Conn., has awarded a contract at its Fairfield plant, 60x160 ft., one story and 60x140 ft., one story.

The American Locomotive Co. has sold its plant at Providence, R. I., to the United States Rubber Co. The plant has 10 acres of land and several large buildings. It was used by the American Locomotive Co. to manufacture automobiles and later as a munitions plant.

Landers, Frary & Clark, New Britain, Conn., suffered a fire loss of about $5,000 in its tinning building, March 11.

The Morgan Construction Co., Worcester, Mass., rolling mill machinery and gas producers, has bought the property on Crescent Street of the Webb Granite & Construction Co. including 405,372 ft. of land. The company has no immediate plans for building on the site and will hold it for future development.

The Specialty Automatic Machine Co., Chelsea, Mass., paper box machinery, has been incorporated with authorized capital stock of $50,000. The incorporators are L. E. LaBomboard, Harlow M. Russell and Waldo B. Russell.

The Francis Cobb Co., shipbuilder, Rockland, Me., has been taken over by a new corporation, the Francis Cobb Shipbuilding Co. The shipyard will be enlarged to take care of new contracts. William T. Cobb retires as president but remains as a director. The officers of the new company are H. Nelson McDougall, president, and Benjamin C. Perry, treasurer and general manager.

The Traut & Hine Mfg. Co., New Britain, Conn., is erecting a building, 31x34 ft., two stories, to be used for recreation purposes by its employees.

The Consolidated Engineering Co., industrial fans and heating specialties, with plants in Watertown, Mass., and Chicago, has been taken over by the Bishop-Babcock-Becker Co., Cleveland.

The Liberty Ordnance Co., Bridgeport, Conn., has awarded a contract for an addition, 45x50 ft., one story.

The Boston Metal Works, Inc., Boston, has been incorporated with authorized capital stock of $7,500. A. G. Decatur is president and Arthur J. Driscoll, 22 Dunster Road, treasurer.

The Crompton & Knowles Loom Works, Worcester, Mass., is to add another story to one of its buildings, 54x184 ft.

The United States Government has awarded a contract for a laboratory building at the Springfield Armory, Springfield, Mass., to be 32x92 ft., one story.

The Mianus Motor Works, Stamford, Conn., has increased its capital stock from $325,000 to $500,000.

The Marlin-Rockwell Corporation, New Haven, Conn., has begun the erection at its new plant on Dixwell Avenue, of another building, 50x105 ft., one story.

The Colt's Patent Firearms Mfg. Co., Hartford, Conn., has awarded a contract for an addition to a die sinking building, 26x195 ft., one story. The roof of the present building, 32x206 ft., will be raised 4 feet.

The Armstrong Mfg. Co., Bridgeport, Conn., is to build an addition 100 ft. long, to its plant on Knowlton Street.

The Groton Iron Works, Groton, Conn., shipbuilder, is arranging to erect a large number of houses for its workmen.

The Risdon Tool & Machine Co., Naugatuck, Conn., has awarded a contract for an addition, 98x104 ft., one story.

The H. C. Hart Mfg. Co., Unionville, Conn., is enlarging its plant to meet the demands of the market, these having increased in the past year both in domestic and export trade. The improvements under way will result in a doubling of output in some of the company's lines, which include hardware products and dies.

Philadelphia

PHILADELPHIA, March 18.

The Ordnance Department, Washington, is taking bids for the construction of a one-story grenade and detonator assembling shop, about 23 x 72 ft. and 21 x 34 ft., at the Frankford Arsenal, Philadelphia.

The George Sachsenmaier Co., Philadelphia, has been incorporated with a capital of $200,000 to manufacture machinery. Henry F. Sachsenmaier, Glenside, is treasurer.

The Schneider-Bowman Co., Frankford and Van Dyck avenues, Philadelphia, has acquired a one-story foundry building at 1612 Vandyke Street, Frankford, for about $35,000.

The Bridgman Brothers Co., 131 South Thirty-first Street, Philadelphia, manufacturer of steam-fitters' supplies, will build a new one-story pipe shop at Thirty-first and Chestnut streets.

The Kensington Brass Foundry & Mfg. Co., Philadelphia, has been incorporated in Delaware with capital of $50,000 to manufacture brass, iron and steel products. Thomas W. Moore, L. V. Gillian and J. D. Levy, all of Philadelphia, are the incorporators.

The Crescent Insulated Wire & Cable Co., Olden and Taylor streets, Trenton, N. J., has acquired property 110 x 275 ft., north of its plant, for extensions.

The Camden Iron Works, Camden, N. J., is reported considering the construction of extensions to its plant for shipbuilding work.

The International Motor Co., Allentown, Pa., is building a one-story machine shop, about 100 x 480 ft., to cost $75,000.

The Merchants' Shipbuilding Corporation, Bristol, Pa., has acquired extensive property adjoining its plant, providing a total of about two miles of waterfront.

Contract has been let for the one-story machine shop to be erected this spring by Brubaker Brothers, Millersburg, Pa., manufacturer of machine tools, 75 x 80 ft., at a cost of $15,000.

The American Car & Foundry Co., Milton, Pa., has awarded contract for a one-story rivet shop.

The office and pattern shop of the J. R. Herbertson Sons Co., South Brownsville, Pa., was destroyed by fire Feb. 23, including the total destruction of patterns for steamboats and coal-mining machinery valued at $10,000, but there was no damage done to machinery.

Baltimore

BALTIMORE, March 18.

A power plant and cooper shop will be erected by the Baltimore Mfg. Co., Baltimore, at Central Avenue and Bank Street.

The E. I. duPont DeNemours Co., Wilmington, Del., has acquired the plant of the B. F. Shaw Co., Second and Lombard streets, and will use it for the fabrication of pipes and the manufacture of auxiliary equipment for munition plants. The present organization of the Shaw company will be retained for the operation of the works.

The District Clay Products Co., 1802 Whitmore Avenue, Baltimore, has been incorporated with $125,000 capital stock by Samuel A. Ver Valen, Samuel G. McClave and Clarence L. Peaslee to manufacture brick, tile, hollow ware, etc.

The Bartlett Hayward Co., Scott and McHenry streets, Baltimore, will build a one-story, 32 x 32 ft., fireproof boiler shed at a cost of $2,000.

The Galena Electric Light & Power Co., Galena, Md., has

been incorporated with $10,000 capital stock by Allison P. and A. Raymond Prettyman, Lawrence R. Vansant, James D. Davis, Jr., O. S. Davis, Harry A. Bolton and Harry S. Dempsey.

The Sapero Box Co., 220 East Grindall Street, Baltimore, manufacturer of packing cases, will establish a wood-working factory at 2601 Boston Street and install 300 hp. in motors.

The Seaford Hardware Co., Seaford, Del., has been incorporated with a capital of $50,000 to manufacture hardware, etc. Charles E. Hastings, Lacey L. Hardesty and John E. Eskridge, Seaford, are the incorporators.

The Potomac Shipbuilding Co., Quantico, Va., recently organized, is planning for the construction of a shipbuilding plant to cost about $200,000. The company will build cargo and other type vessels. George R. Collins, Colorado Building, Washington, is president.

The Marine Repair Corporation, Newport News, Va., will install new machine-shop equipment.

The Kenilworth Tile Co., Newall, W. Va., is planning to rebuild its plant, recently destroyed by fire, at a cost of about $50,000. The works will consist of a one, two and three-story building, 140 x 300 ft.

The Birmingham Box & Veneer Works, Birmingham, Ala., will build a new addition to its plant, 80 x 190 ft., for increased capacity. New wood-working machinery will be installed. E. T. Douglass is president.

Fire March 12 destroyed the machine and blacksmith shop of the Woodstock Iron & Steel Corporation, Anniston, Ala.

The Mobile Shipbuilding Co., Mobile, Ala., has increased its capital from $100,000 to $1,000,000.

The plant of the Eufaula Cotton Oil Co., Eufaula, Ala., was completely destroyed by fire March 10 with a loss, including crushing and other machinery, estimated at $65,000. It will be rebuilt.

The Graphite Mills Co., Ashland, Ala., manufacturer of graphite products, has increased its capital from $80,000 to $250,000.

The Planters' Oil Mill & Gin Co., Kosciusko, Miss., is planning for the installation of new coal-handling and other machinery.

Pittsburgh

PITTSBURGH, March 18.

Conditions in the local machinery and tool trades are only fairly satisfactory. Manufacturers and dealers report the demand for large tools, such as lathes, planers, boring mills, etc., is not very active. Few of the large iron and steel companies in the Pittsburgh, Youngstown, and Wheeling districts are making any extensions to their plants, owing to the high costs of labor and materials, and the very indefinite deliveries. Manufacturers in this district having large contracts for gun and shell forgings have been fairly heavy buyers of large tools. Deliveries on lathes, planers, etc., are still very much delayed, running from six months to a year.

No large lists are out, but the Westinghouse Electric & Mfg. Co., is reported to have recently taken a very large order for Government forgings and expects to shortly send out an inquiry for a considerable line of equipment. The Heppenstall Forge & Knife is making some large additions to its plant in this city, and has placed an order with the Laughlin & Barney Machinery Co. for one 5-ton and one 10-ton electric crane to be built by the Champion Engineering Co., Kenton, Ohio.

The general demand for cranes is more active than for machine tools, and deliveries are very much delayed. The General Electric Co., Erie, Pa., has an inquiry out for nine cranes ranging in capacity from 5 to 15 tons.

The Mesta Machine Co., Pittsburgh, is making good delivery on the tandem plate mill it is building for the Youngstown Sheet & Tube Co., Youngstown, Ohio. The United Engineering & Foundry Co., expects to complete before long two new plate mills for the Brier Hill Steel Co., also at Youngstown, which are expected to be ready for operation about June 1.

The Standard Steel Construction Co., Sharon, Pa., builder of steel tank cars, is making an addition to its plant, 60 x 140 ft., and will likely be in the market for cranes and other equipment.

The Miller-Smythe Electric Co. intends to build a new factory on a site it owns in Youngstown, Ohio, and will probably be in the market for some new equipment.

A. B. Pegrament, acting for the Standard Animal Products Co., has bought six acres on Neville Island, Pittsburgh, on which it is proposed to build a plant for the manufacture of lubricants.

The Hudson Sheet & Tin Plate Co., Marietta, Ohio, is making additions to its plant, and has recently bought considerable sheet and tin mill equipment.

The Crucible Steel Co. of America, Pittsburgh, has placed a contract for the erection of a new hammer shop at its Park works in this city, for which some new equipment will be needed.

The Trus Con Steel Co., will build an addition to its plant at Youngstown, Ohio. The main building will be 30 x 400 ft., for which considerable new equipment will be needed.

Chicago

CHICAGO, March 18.

The demand for miscellaneous machine tools in small lots has been active the past week and where the necessary priority orders could be shown sales have been closed quickly. Deliveries can be made with reasonable promptness with most small machines, but tools for heavy work are as hard as ever to obtain. No action has yet been taken on one or two large propositions which are pending. The Winslow Brothers Co., Chicago, has taken steps to double its equipment for the manufacture of 155 mm. shells, and it is understood that the Government has requested other makers of munitions to figure on increasing their output.

Recent demand has been particularly good for horizontal boring, drilling and milling machines.

The Western Electric Co., Chicago, is having plans prepared for a six-story factory, 211 x 675 ft., at Fort-second Avenue and Twenty-second Street, Hawthorne, Ill., at a cost of about $1,000,000. It will be of reinforced concrete, with pressed brick and stone front, metal window frames and iron doors.

Bids are being taken by L. H. Heinz, architect, 128 North La Salle Street, on a one-story addition, 60 x 70 ft., to the plant of A. J. O'Leary & Son, iron workers, Lake and Jefferson streets, Chicago.

The Hubbard Steel Co., East Chicago, has let contracts for a steel foundry, 200 x 600 ft., at 143rd Street and Railroad Avenue, East Chicago, which is expected to be completed in about 90 days.

The Gits Brothers Mfg. Co., Chicago, maker of oil cups, has purchased a site 160 x 275 ft., in the Mills Industrial District of Chicago, on which will be erected a one-story machine shop of saw-tooth construction, to cost $27,000. The company manufactures an oil cup designed to displace grease cups on automobiles, grinding machines, etc.

The Maple City Stamping Works, Monmouth, Ill., manufacturer of oil cans and torches, will remove its plant to Peoria, Ill. J. R. Hanna is president and W. E. Findley is secretary-treasurer.

The Western Foundry & Machine Co., Moline, Ill., has been incorporated with a capital stock of $30,000 to conduct a general foundry business. The incorporators are A. C. and R. S. Sinclair and J. H. Johnson.

The plant of the Ottawa Pianophone Co., Ottawa, Ill., specializing in the manufacture of talking machines, was destroyed by fire, March 9, with loss of about $85,000.

The Chicago Shipbuilding Co., Avenue N, Chicago, will erect a two-story addition, 20 x 65 ft., to cost $20,000.

J. L. Sparks, West Grand Avenue, Chicago, is building a one-story foundry, 50 x 75 ft., at 1723 Carroll Avenue, to cost $10,000.

The Harrington & King Perforating Co., Chicago, manufacturer of wire cloth, screens, etc., is taking bids for the construction of a one and two-story plant, 125 x 310 ft., on Taylor Street, to cost about $100,000.

The Western Steel Car & Foundry Co., 136th Street, Chicayo, is buildinf a new one-story foundry, 175 x 225 ft., at Hegewisch, Ill., to cost about $50,000.

The Gas Tank Rechanging Co., Keokuk, Iowa, has had plans prepared for a new two-story extension, 50 x 150 ft., to cost about $40,000.

Fire on March 4 destroyed part of the plant of the Turney Wagon Works, Fairfield, Iowa, with loss of about $40,000.

The Green Engineering Co., South Kennedy Avenue, East Chicago, Ind., will build a one-story foundry, 45 x 100 ft., to cost $50,000.

The Joseph W. Hays Corporation, Michigan City, has been incorporated with a capital stock of $275,000 by Dr. Frank R. Warren, B. A. Tuttle and F. A. Deahl, the latter a lawyer of South Bend, Ind. It has leased a plant at Michigan City and will manufacture draft gages, recording thermometers, gas recorders, etc.

Milwaukee

MILWAUKEE, March 18.

Although the production of machine tools in this district has been considerably enlarged the past 60 days by completion of extensions, it has been practically impossible for manufacturers to catch up on deliveries. This is particularly true of the milling machine industry, which has undergone much expansion in recent months. New business continues to be received in large volume, with the demand maintained at the highest level.

The facilities of practically every foundry and machine-shop in Wisconsin are occupied to the fullest extent by sub-letting of work by the large manufacturers, who find it impossible to take care of all the orders on hand. This development of the metal-working business is furnishing a considerable volume of business for machine-tool dealers. While the requirements of the individual shop are small, the aggregate is large.

The Optenberg Iron Works, Sheboygan, Wis., manufacturing machine-tools, boilers, tanks, stacks and structural material, has passed from the ownership and control of John Henry Optenberg, founder and president, to his associates, who will continue the business on the same policy. Mr. Optenberg has been ill since May, 1917, and will retire from active business. J. Hilpertshauser, formerly manager of the machine department of the Globe Foundry & Machine Co., has been elected president in his stead. William F. Moeller remains as vice-president; R. W. Busse, secretary, and H. H. Roehl, treasurer. The company employs 65 men and at present is executing a Government contract for radial drills for delivery to France.

The Green Bay Foundry & Machine Co., Green Bay, Wis., has been taken over by Chicago interests and R. A. North of Green Bay, who have purchased the plant, equipment and stock and will continue to manufacture industrial screens for municipal works, paper mills, etc. John J. Arvey and Henry L. Indra, founders and chief stockholders, will retire. The new officers are: President, E. Payson Smith; vice-president, William Smith; secretary and treasurer, C. Nelson Smith, all of Chicago; general manager, R. A. North, Green Bay. Enlargement of the Green Bay plant is contemplated this year, although definite plans have not been completed.

The Rassmann Mfg. Co., Beaver Dam, Wis., maker of steel stock and dairy barn equipment and agricultural implements, has increased its capital stock from $15,000 to $75,000. The company some time ago purchased the plant and equipment of the former J. S. Rowell Mfg. Co., farm implements and machinery, Beaver Dam, and is increasing its output threefold. Hugo Rassmann is secretary.

The Monarch Tractor Co., Watertown, Wis., is contemplating the erection of an addition to its machine shop and assembling room at a cost of about $20,000. Further details are not announced.

The Turner Mfg. Co., Port Washington, Wis., maker of gas engines and farm tractors, will select an architect soon to prepare plans for a new machine shop to provide increased facilities for manufacturing tractors. The company recently increased its capital stock from $125,000 to $250,000. L. M. Turner is general manager.

The Ladish Drop Forge Co., Cudahy, has engaged Klug & Smith, consulting engineers, to design and supervise the erection and equipment of a new forge shop, 50 x 250 ft., of reinforced concrete, steel and brick, at its main plant on Packard Avenue. Foundations are now being laid.

The Lake Superior Electrical Co., Superior, Wis., manufacturer of automatic electric signal and steering control systems, has changed its name to the Benson Electric Co. and increased its capital stock from $50,000 to $250,000. The new officers are: President, M. B. Benson; vice-president, William K. Link; secretary, J. H. Cooke; treasurer, R. C. Ogilvie; directors, Robert J. Close, Duluth, Minn.; I. F. Halton and Harold Armstrong, New York City. The company was organized two years ago and is operating in the former plant of the Superior Iron Works.

The board of industrial education, Appleton, Wis., will receive sealed bids until March 28 for the construction of the first unit, 98 x 100 ft., three stories, of the new vocational training institute, to cost $200,000. C. D. Thompson is secretary.

The Charles A. Honold Co., Sheboygan, Wis., manufacturer of plumbing goods and electrical supplies, has increased its capital stock from $25,000 to $50,000. Charles A. Honold is president.

The Fraser Co., 667 East Water Street, Milwaukee, mill and elevator engineer, will take bids after March 20 for the construction of a $200,000 elevator and warehouse at Oregon and Hanover streets for the L. Teweles Seed Co., 113 Clybourn Street, Milwaukee. Considerable electric motor, conveying, tank and other equipment will be required. Hugo Teweles is president.

The Res Mfg. Co., 2909 Meinecke Avenue, Milwaukee, manufacturer of hardware specialties, has awarded the general contract to J. D. Morrison, 625 Sixty-ninth Avenue, West Allis, for a two-story factory addition, 55 x 75 ft., costing about $12,000 with equipment.

Hans Sattler, 330 South River Street, Sheboygan, Wis., has disposed of his garage and sales business and is installing additional machine-shop equipment for the manufacture of a speed and mileage recording device for motor vehicles which he has designed and patented.

The Sacred Heart Hospital, Eau Claire, Wis., has plans by Foeller & Schober, Green Bay, Wis., for a $25,000 boiler house and laundry plant, 40 x 95 ft., of concrete and brick. The Rev. J. C. Straub is director.

The Protheroe & McGinnis Auto Co., Baraboo, Wis., which has been assembling motor trucks and truck attachments on a limited scale, is planning to enlarge its machine-shop to manufacture automatic hoisting apparatus for motor dump trucks.

The Four Lakes Ordnance Co., Madison, Wis., is completing work on its new steel and brick plant, 100 x 500 ft. in size, and is installing equipment. It is expected that the manufacture of light naval ordnance will begin April 1 with an operating force of about 350 men. John Bill, formerly of Bethlehem, Pa., will be manager of the lathe department.

Detroit

DETROIT, March 18.

Demand for standard machine tools has been greatly stimulated by Government orders. Automobile manufacturers operating on war work are employing more men and equipping their factories with many new machines for special work. Numerous inquiries were received the past week for machine tools in small lots.

Construction work is opening up with the seasonable weather, and despite the scarcity of materials indications are that within the next few weeks numerous large projects will be launched.

Skilled labor is still scarce with little likelihood of the supply increasing. Common labor is plentiful.

The factory of the Monarch Steel Castings Co., Detroit, was completely destroyed by fire last week with an estimated loss of $350,000. It was engaged in the production of war supplies and railroad materials.

The building and equipment of the foundry formerly owned by John Minnie, Galesburg, Mich., will be utilized by a company organized for war work by Frank H. Scott, Edward W. Cole, and Lorin H. Skinner. Some new equipment will also be installed.

The Essex Motor Co., Detroit, which was organized last year by officials and others connected with the Hudson Motor Car Co., Detroit, will shortly begin the manufacture of its new motor car at the plant of the Hudson Company. Plant No. 5 of the Studebaker Corporation had been leased by the Essex company, but owing to war orders the Studebaker Corporation found that it needed all its available buildings and the deal was canceled.

The Reo Motor Car Co., Lansing, Mich., has completed its first caterpillar tractors for which it has Government orders and is installing new machinery to take care of the contract.

The Goodale Co., Kalamazoo, Mich., which recently received a large Government contract, is equipping its plant with special machines to better handle the work. The contract calls for a large amount of special machining and it is reported that this will be taken over by three Kalamazoo companies. The Goodale Co. is also working on a sub-contract amounting to over 1,000,000 castings.

The Grand Rapids Show Case Co., Grand Rapids, Mich., has let a contract for a four-story addition on Monroe Avenue. It will be of mill construction 60 x 100 ft., and cost $25,000.

The Commercial Motor Body Corporation, New York, has leased the factory at 452 Franklin Street, Detroit, for three years, which it will use as its Michigan distributing quarters for motor truck bodies. Part of the building which is three stories, 200 x 200 ft., will be equipped for making bodies and the remainder will be used to carry stocks.

The Leonard Tractor Co., Kalamazoo, Mich., organized some time ago, will build a plant at a cost of $300,000, including equipment.

The Leonard Air Washing Machine Co., Kalamazoo, Mich., has been organized with $50,000 capital stock.

The Continental Motors Corporation, Muskegon, Mich., is contemplating a new location for its drop forge department, outside of the city limits. It is stated that plans have

been prepared for a small railroad line from the main plant to the new building.

The plant and equipment of the American Machinery Co., Port Huron, Mich., was recently bought by the American Machines Corporation, a subsidiary of the American-Canadian Resources Co., for the manufacture of shells.

The Ruby Furnace Co., Dowagiac, Mich., will build an addition, 60 x 100 ft., to its molding rooms, to be followed by an addition, 100 x 100 ft., to the main factory.

The Yale Trailer Co., Yale, Mich., has been organized with $10,000 capital stock with the following officers: President, Rene V. Card, Detroit; vice-president, Irving Card; Toledo; secretary and treasurer, Earl R. Card, Yale.

The Porter Co., Ann Arbor, Mich., has been incorporated as the Commerce Body Co., with $90,000 capital stock.

The Alliance Motors Corporation, New York and Detroit, has been incorporated with $250,000 capital stock.

The Hamilton Motors Co., Grand Haven, Mich., has been incorporated under the name of Panhard Motors Co., with $500,000 capital.

The American Commercial Car Co., Detroit, has increased its capital stock from $100,000 to $250,000.

The Inland Metals Products Co., Detroit, has increased its capital stock from $75,000 to $200,000.

The Gillett Mfg. Co., Clio, Mich., has increased its capital stock from $20,000 to $100,000, and changed its name to Gillett Motor Truck Co.

The Standard Machinery Co., Owosso, Mich., has increased its capital stock from $32,000 to $75,000.

The National Device & Drill Co., Coldwater, Mich., has increased its capital stock from $20,000 to $50,000.

The Acason Motor Truck Co., Detroit, has increased its capital stock from $50,000 to $200,000.

Further details of the enormous plant of Henry Ford & Son, for the manufacture and assembling of Fordson tractors, which is being completed at Dearborn, Mich., are announced . The plant will eventually employ 100,000 men. The present quarters, which are temporary, employs but 2000. More than $3,500,000 is being put into the new plant, which includes among other buildings a foundry 120 x 225 ft., stock room 30 x 100 ft.; heat treating room 40 x 145 ft.; assembling shops 44 x 165 ft. and 44 x 105 ft.; pattern shop, 50 x 105 ft.; gas producer plant 54 x 45 ft.; power plant 70 x 45 ft., and two machine shops 75 x 285 ft. and 90 x 225 ft., respectively. The plant is located across from the Ford blast furnaces and at first will employ 25,000 men. Additions will constantly be made. Eighty tractors a day are being turned out in the temporary plant, but by the first of May 150 will be the day's production, with the goal of 50,000 during 1918.

Fire, March 9, destroyed the plant of the Monarch Steel Castings Co., Solvay Avenue, Detroit, Mich., with loss estimated at $40,000.

The Christe Kline Forge Co., St. Aubin Avenue, Detroit, Mich., is taking bids for the erection of a one-story forge shop on Franklin Street, to cost about $25,000.

Cleveland

CLEVELAND, March 18.

A steady demand is noted for small lots of machine tools for work on Liberty airplane motors, trucks, trailers and tractors. The Erie Forge Co., Erie, Pa., has inquired for four lathes and a radial drill, grinding and milling machines. An inquiry that is expected from a leading automobile manufacturer for a large amount of machinery for Government work has not yet come out. There is a fair demand for screw machines in lots of from two to three, mostly from the Chicago district.

The Osborn Engineering Co., Cleveland, is preparing plans for a new factory, to be erected by the Armstrong Rubber Co., Garfield, N. J., for the manufacture of automobile tires.

The Hertner Electric Co., Cleveland, has been incorporated with a capital stock of $100,000 by F. W. Treadway, F. H. Pelton and others.

The Northern Boiler Co., Cleveland, has placed contracts for the erection of a new plant at 8600 Maywood Avenue and the Big Four Railroad.

The Cleveland Vise & Mfg. Co., Cleveland, has been incorporated with a capital stock of $10,000 by F. P. Chamberlin, E. D. Vail, C. H. Stevens and others.

The Cleveland Hardware Co., Cleveland, will enlarge its No. 2 plant by the erection of a one-story addition, 40 x 200 ft., to its machine shop.

The Standard Pressed Steel Co., Cleveland, has been incorporated with a capital stock of $25,000 by Joseph J. Boehm and others.

G. F. Mitchell & Sons, Cleveland, have awarded contracts for the erection of an addition, 60 x 150 ft., two stories, for sheet metal stamping work.

The Bio-Bar Mfg. Co., maker of form equipment, will move its business from Upper Sandusky to Sycamore, Ohio, and it is stated, will later erect a plant.

The Hanson Clutch & Machinery Co., Tiffin, Ohio, has purchased a site on which it will erect two new factory buildings.

The Solid Steel Scissors Co., Fremont, Ohio, has been incorporated with a capital stock of $10,000 by George Zimmerman, H. J. Miller, Charles L. Halter and others.

The W. G. Nagel Electric Co., Toledo, Ohio, is reported to have purchased the adjoining plant of the Advance Machinery Co.

The Ohio Tread Tire & Mfg. Co., Sandusky, Ohio, contemplates the erection of a new plant shortly.

The Detroit Foundry & Engineering Co., Detroit, Mich., is negotiating for a site for a plant in Lorain, Ohio.

The D. Connelly Boiler Co., Cleveland, has awarded contracts for an addition to its main building, 80 x 140 ft., of steel, brick and glass sides. The runways for the three overhead cranes will be extended into the new part. This company is now installing a new set of very large plate-bending rolls. They have also added two 6-ft. radial drills and have several more on order.

Cincinnati

CINCINNATI, March 18.

As far as actual war munitions are concerned few new contracts have been received very recently by local and nearby concerns, but other Government purchases have varied considerably lately, and include everything from auto-trucks and army kitchen trailers to sheet metal specialties. In the machine-tool line boring and turning mills, planing machines and milling machines are in heavy demand, and makers of these tools are doing everything possible to rush deliveries. Large lathes are also wanted, but the smaller sizes can be obtained for fairly prompt shipment. A good call also is reported for shaping machines, mostly from shops having sub-contracts for Government work.

Both common and skilled labor is needed, but the output of local shops is more encouraging, and in a few cases machine tools have been shipped out a little ahead of time. Delays en route, on account of the freight congestion that is by no means ended, are still a matter of complaint that is almost general in its character. The foundries are making better deliveries of machine-tool castings.

The Hill-Brunner Foundry Supply Co., Cincinnati, has acquired an additional site near its plant and has let contract for a building 90 x 100 ft., two stories.

The Proctor & Gamble Co., Cincinnati, will erect a large hydrogen gas plant adjoining its factory in Ivorydale. A boiler house addition, 50 x 100 ft., will also be made. Practically all of the necessary equipment has been bought.

C. W. Handman, business manager, board of education, Cincinnati, will open bids April 8 for the heating, ventilating and air-washing equipment for the new Hoffman public school building.

The Recording & Computing Machines Co., Dayton, Ohio, has recently secured a loan of $3,000,000 on its bonds. The company has large Government contracts and will enlarge its plant at Edgemont, as well as install additional equipment in the present buildings.

The Detrick Voting Machine Co., Dayton, Ohio, has been incorporatel with $10,000 capital stock by J. F. Detrick and others. It is reported that a plant will be fitted up for the manufacture of voting machines.

The Springfield Light, Heat & Power Co., Springfield, Ohio, has let contract for two 500-hp. Babcock & Wilcox boilers to be installed in a recent addition to its plant.

Work has commenced on the addition to the plant of the Superior Gas Engine Co., Springfield, Ohio. It will be of concrete, 60 x 160 ft., two stories.

The Ohio State Stove Co. Columbus, Ohio, has increased its capital stock from $75,000 to $250,000 and will enlarge its plant.

The Solar Metal Products Co., Columbus, Ohio, has let contract for equipment that will be installed in its tinning department.

I. H. Schlezinger, Columbus, Ohio, scrap iron dealer, has purchased a plant at 448 Donaldson Street and will remove to that address. Some additional yard equipment will be needed.

The Kilgore Mfg. Co., Columbus, Ohio, is fitting up its foundry for making plow points.

The Dayton Malleable Iron Co., Ironton, Ohio, whose plant has been closed three weeks for installing extra equipment, has now resumed work in all departments.

The Wapakoneta Wheel Co., Wapakoneta, Ohio, will erect a blacksmith shop, one story, 37 x 60 ft., and also two buildings that will be used as dry kilns. The company has a Government contract.

The Central South

LOUISVILLE, March 18.

The local plants making boilers, machinery, pumps, etc., are receiving a fair percentage of Government business. The ice machinery business appears to be a dead letter just now. Very little activity is reported in the foundries, there being practically no demand for gray iron castings. As a result many are advertising for business, and make special efforts to obtain work. It is claimed that one large plant in the Ohio Valley has an excess capacity of 400 tons of gray-iron castings per week at this time. The gray-iron casting proposition appears to be largely a matter of poor distribution of work. It is alleged that plants in the East are crowded with such work, but due to long hauls, transportation congestion, etc., very few orders have been placed in the Central West, the South, or west of Pittsburgh.

The Anglo-American Mill Co., Owensboro, Ky., manufacturer of milling machinery, has again increased its capital stock from $1,000,000 to $1,250,000. About six weeks ago the capital was increased from $750,000 to $1,000,000. These increases are to take care of a heavy production.

The boiler department of the Henry Vogt Machine Co., Louisville, is busy supplying Government orders; but it reports a very light commercial demand.

Work has started on a $75,000 warehouse at the foundry plant of the Standard Sanitary Mfg. Co., Louisville, manufacturer of plumbing goods, bathtubs, etc.

There has been a fairly active demand for motors during the past few days, the American Electric Co. receiving orders for two 100-hp. motors for the C. C. Mengel & Brother Co., mahogany manufacturer; the Marine Electric Co., 17 motors; total 150 hp., for the Magic Kellar Soap Co.; and the James Clark Electric Co., nine motors of 66 hp., for Palmer & Hardin, furniture makers.

C. F. Thomas, architect, Louisville, has drawn plans for rebuilding burned power plant of the Voss Table Co., which recently suffered a fire loss of $30,000.

The Lucas-Smith Elevator Mfg. Co., Chattanooga, Tenn., has changed its name to the Smith Elevator Mfg. Co.

Knoxville machinery manufacturers are having labor troubles, about 200 machinists having struck for an increase to 60c. per hr. from 47½c. to 55c. per hr.; one apprentice to each five machinists and an increase of 10c. per hr. for the specialists of handy men.

Contracts will be let at an early date for rebuilding the power house of the Shamrock coal mine, near Madisonville, Ky., operated by the St. Bernard Mining Co. This plant, which was the largest power plant connected with mine operations in Western Kentucky, was recently dynamited and later took fire. The original cost was about $50,000.

Indianapolis

INDIANAPOLIS, March 18.

The Steel Vehicle Wheel Tire Corporation, Indianapolis, has been incorporated with $20,000 capital stock to manufacture special machinery. The directors are T. S. McGehee, C. A. Wofford and C. R. Wofford.

Several of the 26 new buildings being erected by the Stenotype Co., Indianapolis, have been completed, all of which will be devoted to the manufacture of war munitions. The company not only does the machine work but finishes the products ready for the battlefields. The extensions will require an additional force of 1500 men. R. M. Bowen is chairman of the board of directors.

The Basket Mfg. & Sales Co., Peru, Ind., has been incorporated with $30,000 capital stock to manufacture basket making machinery. The directors are J. E. Deetz, Walter D. Hoover and O. F. Rhodes.

The National Cup Co., Montpelier, Ind., has been incorporated with $10,000 capital stock to manufacture valve cups. The directors are D. J. Stoltz, C. H. Morse and B. H. Stoltz.

The main offices of the American Zinc Products Co. have been removed from Warren, Ohio, to Greencastle, Ind., where it took over the old tin plate mill. The company recently organized with $1,000,000 capital stock. D. Warren Kerr is president.

The municipal light and water plant, Attica, Ind., was destroyed by fire, March 10, causing a loss of $40,000. The new plant will cost $50,000. Ben H. Freeland is superintendent.

The Perryville Stove Co., Perryville, Ind., will build a new machine shop and foundry addition, one-story, 50 x 100 ft., respectively.

St. Louis

ST. LOUIS, March 18.

The Ozark Coal & Mining Co., Ozark, Ark., M. V. Waterfield secretary and manager, is in the market for about $6,000 worth of coal mining, power plant machinery, etc.

The King Mercantile Co., Rector, Ark., is in the market for about $27,500 worth of cotton gin equipment to replace a plant destroyed by fire.

The Consumers Light & Power Co., Madill, Okla., has plans for the equipment of an electric light and power generating plant.

E. L. Standley, Rush, Ark., will equip a plant at Yellville, Ark., for the manufacture of ore concentrating tables and other mining machinery.

Sam A. Neville, Meridian, Miss., will expend $150,000 on the equipment of a plant for building freight cars.

The Pioneer Shale Oil Co., H. C. Wolf secretary, Oil Exchange Building, Oklahoma City, Okla., is in the market for shale crushing and distilling machinery. Bids will be opened May 15.

The Ringling Oil & Refining Co., Ringling, Okla., T. A. Harwell, Arch Carpenter and others interested, will equip an oil refinery at a cost of about $200,000.

The Texas & Pacific Railway, E. F. Mitchell, chief engineer, Dallas, Tex., will equip an eight-stall round-house and machine shop at Texarkana, Ark., to cost about $25,000.

Okmulgee, Okla., is having plans prepared by Burns & McDonnell, Kansas City, Mo., Interstate Building, for waterworks and pumping plant improvement and sewage disposal plant to cost about $150,000.

Harrisonville, Mo., is in the market for additional waterworks pumping station machinery.

The plant of the Searcy Oil & Ice Co., Searcy, Ark., recently destroyed by fire, will be replaced, requiring about $25,000 worth of machinery.

The Southern Wheel Co., St. Louis, is building a new one-story plant, 75 x 100 ft., to cost about $20,000.

The Warren Steel Casting Co., St. Louis, has commenced the erection of a one-story foundry, about 80 x 200 ft., on Fairview Street, to cost $15,000.

M. B. North will re-equip a cotton gin burned at Helena, Ark., and is reported in the market for about $12,000 worth of equipment.

Shattuck, Okla., will rebuild its electric light and waterplants and in addition will install an oil fuel steam plant.

The Valier & Spies Milling Co., St. Louis, will equip an addition to its milling plant requiring about $24,000 worth of machinery.

The C. M. Pritchard Co., Tulsa, Okla., will equip a plant for the manufacture of steel tanks and will require about $32,000 worth of machinery.

The Colin Oil Co., of Ardmore, Okla., a subsidiary of the Gulf, Colorado & Santa Fe Railroad Co., will equip a pipe line and pumping stations between Healdton and Ardmore, Okla., with a daily capacity of 24,000 bbl.

The American Roofing Co., Kansas City, Mo., will re-equip a plant which was burned with a loss of $20,000 on equipment.

The Engel Paper Box Specialty Co., St. Louis, W. W. Stroop, secretary, 1906 Pine Street, is in the market for machinery for the manufacture of paper cans and tubes.

California

LOS ANGELES, March 12.

The Baker Iron Works, North Broadway, Los Angeles, has filed plans for the construction of a two-story addition to cost about $5,500.

The Bowerbank Expansion Radiator Co., Los Angeles, has been incorporated with a capital of $50,000 to manufacture radiators. John W. Bowerbank, E. F. Peer and H. M. Snyder are the incorporators.

L. B. Dapron, Corcoran, is planning for the erection of a four-stand cotton gin at Corcoran. It is also planned to build a smaller gin at Fresno.

The Schultheiss Co., San Diego, manufacturer of brass, cast-iron and bronze fittings, has awarded a contract for its new plant at Boyle and Slauson avenues, Los Angeles, in-

cluding a machine shop, 50 x 100 ft.; core and finishing shops, each 50 x 100 ft.; foundry, 100 x 200 ft.; pattern shop, 20 x 30 ft., and office building, 40 x 40 ft. Valentine Katzenberger, Los Angeles, is the contractor.

The Los Angeles Valveless Pump Co., 316 East Third Street, Los Angeles, has been organized to manufacture pumps. Frank F. Ambrose and George H. Leland head the company.

The Kusel Foundry Co., 2418 Santa Fe Avenue, Los Angeles, has been organized with L. E. Kusel as head.

The Stearns Mfg. Co., Los Angeles, has been incorporated with a capital of $25,000 to manufacture tools and do general machine work. Frank L. Stearns, Ralph C. Long and B. C. Donnelly are the incorporators.

The Ralph J. Chandler Co., Mormon Island, Wilmington, Los Angeles, will erect a one-story machine shop, 36x130 ft.

The Staggard Radiator Co., Los Angeles, has been incorporated with a capital of $50,000. H. A. Cureton, 4520 Gramercy Place; N. B. Johnson, 520 West Pico Street, and George R. Hamilton, 520 West Pico Street, are the incorporators.

The Marine Equipment Co., 739 South Los Angeles Street, Los Angeles, has awarded a contract for the erection of two one-story buildings, 80x100 ft., and 24x65 ft., at Wilmington to manufacture marine hardware and other specialties.

The Western Forge & Mfg. Co., Los Angeles, has been incorporated with a capital of $100,000. G. L. Cox, James E. Long and G. W. MacLellan, are the incorporators.

The Government has made an appropriation of $1,750,000 for the construction of a naval aeronautical academy at North Island, San Diego, Cal. The proposed structures will include a department for building and repairing aeroplanes, etc., and is estimated to cost $2,000,000 when completed.

The AAA Auto Parts Mfg. Co., 160 East Jefferson Street, Los Angeles, has been organized to manufacture automobile parts. Julius Ortlieb and J. Von Breton head the company.

The Cousins-Howland Tractor Co., Hanford, Cal., will build a one-story addition to its plant on East Seventh Street, 50x150 ft.

The Pruitt-Helmer Co., Los Angeles, has been incorporated with a capital of $50,000 to manufacture vending machines and other specialties. C. D. Pruitt, P. G. Helmer and R. L. Van Dusen, are the incorporators.

The Western Gas Engine Co., 900 North Main Street, Los Angeles, has awarded a contract for the erection of a one-story addition, 40x150 ft.

The United States Shipbuilding Corporation, San Diego, Cal., has commenced the erection of a steel fabricating shop, 60x450 ft., at its shipyard on San Diego Bay. It will specialize in the construction of all-steel vessels. The company's headquarters have been removed from Los Angeles to San Diego.

Texas

AUSTIN, March 18.

The Bridges Motor Car & Construction Co. has purchased 289 acres at Fort Worth for $100,000, upon which it will construct an automobile manufacturing plant. No announcement has been made as to the amount of money that will be invested.

The Bridges-Weaver Machinery Co., Dallas, has increased its capital stock from $300,000 to $500,000 and will enlarge its plant.

The Brown-Ard Refining Co., Brownwood, has purchased 26 acres as a site for an oil refinery.

The Brownwood Refining Co., Brownwood, has plans for an oil refinery with a daily capacity of about 700 bbl.

The Producers Pipe Line & Storage Co., Brownwood, will install a number of oil pumping plants in connection with its pipe line system.

The Pacific Northwest

PORTLAND, ORE., March 12.

It is now hoped by steel shipbuilders that the delays which have held up material from the East will be cleared away in a short time and that the steel needed will begin to arrive at an early date. J. R. Bowles, president Northwest Steel Co., states that there are about 150 cars on the way to that plant alone, and up to a recent date they were not reported west of Chicago. On the other hand, machinery continues to arrive for wooden steamers being built in the Oregon district, and within a few weeks installation will begin. Sixty-seven standard wooden vessels are on the stocks in the Portland district and about 87 in the Seattle section. Lack of calkers has held up the work somewhat, but even with this delay the work is ahead of schedule. Practically all plants are working three 8-hr. shifts. Skilled labor continues scarce, although common labor is plentiful.

Several iron plants and foundries in the Puget Sound district have been under investigation by the Navy Department with regard to making marine repairs. It is believed a large amount of this work will be done in this section in the near future, as there are many foundries that, with slight improvements, could be made available.

A noticeable feature in this section is the large number of new machine shops, manufacturing plants, flour mills and grain elevators that have either been put in operation or for which plans are being completed. The high cost and extreme difficulty in securing new equipment has resulted in many old plants, particularly defunct iron works and machine shops, being purchased by shipbuilding companies and iron foundries and the better part of the machinery overhauled.

Fuel oil shortage in Oregon will compel some large industrial plants to close if relief is not soon given, according to Fuel Administrator Fred J. Holmes. The supply is ample, but transportation facilities are lacking.

The Hallidie Co., Spokane, has bought a site, 150 x 180 ft., covered by a two-story building, which will be equipped as a machine shop for making steamship machinery. B. B. Truett, president, who returned from Washington a few days ago, reports Government contracts to the amount of $1,500,000.

E. K. Irwin, Spokane, has organized the West Coast Shipbuilding Co. for $1,000,000 and will spend $350,000 in establishing a concrete shipbuilding plant at Everett, Wash. It is said to have secured contracts from the French Government for four vessels of 5000 tons each and a length over all of 466 ft.

The Twohy Brothers Co., Portland, has been awarded contracts amounting to $17,000,000 for the construction of 10 steel vessels of about 8000 tons each. The ships will be built in the Erickson Engineering Works, Seattle, in which the Twohy Brothers and O. D. Colvin, Seattle, have acquired a half interest.

The Supple & Ballin Shipbuilding Corporation, Portland, has recently inaugurated a 10-hr. day to increase production.

The Boston-American Mining Co., Everett, Wash., has purchased a sawmill on the Skagit River, with a daily capacity of 40,000 board ft. The plant will be overhauled and considerable new machinery installed.

The Patterson-McDonald Shipbuilding Co., Seattle, will erect a machine shop to cost $12,000.

The F. M. Martin Grain & Milling Co., Cheney, Wash., will begin the construction of an 800-bbl. flour mill to replace the present 260-bbl. plant. A five-story concrete building with a 15,000-bu. elevator will be built, to cost $150,000.

The American Can Co., Vancouver, Wash., is completing plans for its new plant and construction will start shortly.

The Sutton Luedtke Iron Works, Vancouver, Wash., will build an addition 30 x 50 ft. It is filling Government orders for iron castings.

The Pacific Box Factory, Tacoma, Wash., has purchased a site in that city and will erect a box factory equal in size to its present plant. It will have a capacity of 20,000 boxes per month and will be operated under the name of the Aloha Box Co.

The Meacham & Babcock Co., shipbuilder, Seattle, will erect a blacksmith shop 45 x 80 ft., to cost $3,000.

The Skinner & Eddy Shipbuilding Corporation, Seattle, will erect a pipe shop, 40 x 172 ft., to cost $5,000.

The Skagit Steel & Iron Works, Sedro Woolley, Wash., is constructing an addition, 60 x 108 ft., as an extension to the mold room. Two 10-ton electric power cranes, a 40-ft. stick boom crane, and 100-ton shears will be added to the equipment.

The Anaconda Copper Mining Co., Great Falls, Mont., expects to have its new copper rod and wire mill in operation by May 1. The plant will cost more than $500,000 and will have a capacity of 200,000 lb. of copper rods and 85,000 lb. of copper wire.

Col. Bruce P. Disque, commander of the Spruce Production Division in the Pacific Northwest, stationed at Portland, Ore., has placed an order with the Oregon Planing Mills Owners' Association for 25 carloads of airplane wing beams. It is claimed that airplane construction can be expedited by having all planing mill work done on airplane lumber before it is sent East.

The Jordan Elevator Co., Corvallis, Ore., will build an elevator at Ione, Ore., with capacity of 100,000 bu. and costing $35,000.

The Puget Sound Machinery Depot, Seattle, now constructing a plant in that city, has taken over on a long-time lease the property of the National Iron Works, Seattle.

Additional machinery will be installed for the manufacture of engines, auxiliary machinery and equipment for ships.

The Water Lift & Power Co., Centralia, Wash., recently incorporated for $500,000, will establish a plant to manufacture water motors for irrigation purposes, the invention of F. M. Lewis.

Canada

TORONTO, March 18.

The Standard Shipbuilding Co., Dominion Building, Vancouver, B. C., has just closed contracts with Sir Joseph Maclay, head of the Imperial Shipping Board, for 10 composite steamers, and will establish a plant at Ruskin, near the junction of the Stave and Fraser rivers. Patrick J. Donohue, naval architect, will be superintendent. Construction will begin at once.

The Hamilton Bridge Works Co., Ltd., Hamilton, Ont., at its annual meeting appointed W. B. Champ, managing director, succeeding R. M. Roy, deceased. Mr. Champ has been secretary treasurer of the company for many years. Arthur Martin, also of Hamilton, Ont., was appointed treasurer.

The main building of the Huntley Mfg., Co., Tilsonburg, Ont., was totally destroyed by fire with a loss of $100,000 exclusive of equipment and new machines ready for shipment. The plant will be rebuilt as soon as possible and new machinery installed.

The Canada Carriage Co., Park Street, Brockville, Ont., will build an addition to its plant estimated to cost $40,000.

The Canada Carriage Factories, Ltd., Brockville, Ont., will make extensive additions to their Briscoe motor plant.

The Page Wire Co. of Canada, Walkerville, Ont., will commence work at an early date on the erection of a plant at Three Rivers, Que., to cost $150,000. New equipment will be purchased.

The Phillips Steel & Wire Co., Ltd., Montreal, has been incorporated with a capital stock of $100,000, by Maurice Alexander, Aubrey H. Elder, Felix W. Hackett and others to manufacture wire, machinery, tools, etc.

Williams & Wilson, Ltd., Montreal, have been incorporated with a capital stock of $500,000 by Michael B. Bronstetter, Walter E. Richardson, Keith C. Notman and others to manufacture machinery, hardware, supplies, tools, etc.

The Tolland Mfg., Co., Ltd., Montreal, has been incorporated with a capital stock of $50,000 by Waldo W. Skinner, William G. Pugsley, Gordon G. Hyde and others to manufacture machinery, implements, etc.

The Specialty Paper Bag Co., Ltd., Toronto, has been incorporated with a capital stock of $75,000, by Robert T. Guild, 71 Alberta Avenue, Jessie G. Fraser, and others to manufacture cartons, bags, paper, etc.

R. A. Lister & Co., Ltd., Toronto, has been incorporated with a capital stock of $1,000,000, by Sir Robert A. Lister, Dursley, Gloucester, England; Charles A. Lister, Bristol, England; Walter J. Ellis, 6 St. Anns Road, Toronto, and others to manufacture machinery, tools, implements, etc.

The Nipigon Reserve Iron Co., Ltd., Toronto, has been incorporated with a capital stock of $375,000; by John W. Newcombe, Fort William, Ont.; Frank E. Abbott, 169 College Street, James R. L. Starr and others of Toronto, to manufacture iron, steel, metals, machinery, etc.

The Commercial Acetylene Supply Co., incorporated under the laws of New Jersey to manufacture devices, appliances, machinery, etc., for railroads and lighting, has been granted permission to do business in Ontario with a capital stock of $50,000, and has appointed William H. Wood, 6 Stonehouse Crescent, Toronto, as its representative.

The Auto Piston Ring Co., Ltd., Sherbrooke, Que., has been incorporated with a capital stock of $149,000 by M. Standish, O. B. Somersworth, A. Graham and others to manufacture machinery, tools, piston rings, etc.

Government Purchases

WASHINGTON, March 18.

Bids will be received at an early date by the Bureau of Supplies and Accounts, Navy Department, Washington, under schedule 1732, for one radial universal drill, one 2-wheel emery grinder, one wet-tool emery grinder, one buffing lathe, one 18-in. x 6-ft. engine lathe, one 18-in. x 10-ft. engine lathe, one 32-in. x 14-ft. engine lathe, one extension gap lathe, one 48 x 72-in. extension gap lathe, one vertical turret lathe, one boring, drilling and milling machine, one crank-slotting machine, one upright drill, one gap-grinding machine, one metal planing machine, one pipe expanding and flanging machine, four pipe threading and cutting machines, one vertical boring mill, one open side planer, one belt-driven power hacksaw, one back-geared crank shaper, one back-geared belt driven crank shaper, and one heavy-duty crank shaper, all for Philadelphia; schedule 1739, for one 16-in. x 8-ft. motor-driven engine lathe of selective-head type, and one motor-driven plain grinding machine, both for Pearl Harbor, T. H.; schedule 1741, various navy yards, differential direct chain hoists, spur-geared hoists, ½ to 20 tons, and worm-geared hoists, ½ to 3 tons; schedule 3614½, for Pensacola, one bench lathe, opening March 22; schedule 3618½, for Brooklyn, one pipe-threading machine, opening March 22; schedule 3637½, for Brooklyn, two electric arc welding machines, opening March 22; schedule 3643½, for Brooklyn, one punch and shear machine, opening March 25.

Sealed proposals will be received at the General Engineering Depot, 1438 You Street, N. W., Washington, until 10 a. m., March 26, under circular 722, for furnishing 250 foundry flasks and 125 riddles, 75 foundry bellows and 475 molder's tools. Information may be obtained from the purchasing officer.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, March 8 and 11, for supplies for the naval service as follows:

Schedule 3382½, Steam Engineering

Class 61, Mare Island—One engine lathe—Bid 73, $2,100; 82, $1,773, $1,788, $2,012 and $2,077; 110, $2,385; 125, $2,960; 153, $2,558.

Schedule 3496½, Yards and Docks

Class 65, Norfolk—One electric hoist—Bid 50, $465; 80, $465 and $615; 98, $649; 118, $495; 139, $454; 141, $530; 166, $540.

Class 66, Norfolk—Two revolving pillar cranes—Bid 30, $1,750.

Schedule 3507½, Yards and Docks

Class 201, Philadelphia—Oxy-acetylene cutting and welding outfits—Bid 11, $660.79, part; 19, $1,296.90; 20, $1,390.67, part; 24, no total, part; 48, $1,475.61; 65, $144, part; 74, $432.47, part; 123, $1,182.65, part; 171, $707.48, part.

Schedule 3295½, Steam Engineering

Class 11, Philadelphia—One set plate-bending rolls—Bid 14, $13,990; 16, $13,000; 30, $15,142; 53, $10,706 and $10,927; 62, $9,845; 72, $10,150; 113, $8,900.

Schedule 3339½, Construction and Repair

Class 51, Norfolk—Two board drop hammers—Bid 11, $7,100; 54, $16,950; 53, $7,877; 90, $17,651; 104, $11,850.

Schedule 3340½, Construction and Repair

Class 52, Norfolk—One steam drop hammer—Bid 26, $19,430 and $23,330; 54, $17,847; 53, $28,840; 62, $20,800, $23,283 and $17,293.

Schedule 3341½, Construction and Repair

Class 53, Norfolk—One guillotine billet shear—Bid 30, $19,500; 52, $20,475; 53, $13,595, $13,351, $13,810 and $13,727; 104, $23,464; 117, $12,350.

Schedule 3342½, Ordnance

Class 61, F.o.b. naval station, Key West, Fla.—Two steam-driven air compressors—Bid 37, $9,315; 63, $8,300, $17,073.97, alternate.

Alternate bid—Combination set of spare parts for both machines—Bid 37, $1,749.

Schedule 3370½, Steam Engineering

Class 81, Philadelphia—One precision lathe—Bid 64, $2,214 and $2,141; 100, $2,194.25.

Schedule 3371½, Steam Engineering

Class 82, Portsmouth—Two pipe threading and cutting machines—Bid 29, $650; 53, $632.50; 64, $655 and $465; 79, $2,052; 104, $1,074; 100, $504; 101, $1,467.85.

The names of the bidders and the numbers under which they are designated in the above list are as follows:

Bid 11, Air Reduction Sales Co.; 12, Billings & Spencer Co.; 14, Bethlehem Steel Co.; 16, Cleveland Punch & Shear Works Co.; 19, Burdett Mfg. Co.; 20, Bishop, Babcock, Beecher & Co.; 24, Bird-Wilcox Co., Inc.; 26, Erie Foundry Co.; 29, Fairbanks Co.; 30, Brown Hoisting Machinery Co.; 31, Hilles & Jones Co.; 37, Ingersoll-Rand Co.; 48, Davis-Bournonville Co.; 50, Detroit Hoist & Machine Co.; 52, Mesta Machine Co.; 54, Massillon Foundry & Machine Co.; 62, Niles-Bement-Pond Co.; 63, Norwalk Iron Works Co.; 64, D. Nast Machinery Co.; 65, Federal Brass Works; 72, Southwark Foundry & Machine Co.; 73, General Machinery & Supply Co.; 74, General Welding & Equipment Co.; 79, D. Saunders Sons, Inc.; 80, A. D. Granger Co.; 82, Harron, Rickard & McCone; 90, Williams, White & Co.; 98, Link-Belt Co.; 100, Kemp Machinery Co.; 101, Landis Machine Co.; 104, Sherritt & Stoer Co.; 110, Manning, Maxwell & Moore, Inc.; 113, Scully Steel & Iron Co.; 117, Yoder Co.; 118, Northern Engineering Works; 123, Oxweld Acetylene Co.; 125, Pratt & Whitney Co.; 139, Shepard Electric Crane & Hoist Co.; 141, General Electric Co.; 153, Fred Ward & Son; 166, Yale & Towne Mfg. Co.; 171, Imperial Brass Mfg. Co.